# Exploring financial inclusion among small-scale farmers

## The case of small-scale horticulture in Ghana

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by

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A master thesis submitted to Delft University of Technology
in partial fulfilment of the requirements for the degree of
**Master of Science**
in Management of Technology
at the Faculty of Technology, Policy and Management.

To be defended publicly on Thursday April 18, 2024 at 10:00.


| | | |
|---|---|---|
| Student number: | 4695763 | |
| Project duration: | August 28, 2023 – April 18, 2024 | |
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Cover: Ghanaian Woman Carrying Water by Karen Kasmauski under Editorial RF

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# Preface

In this report, I present the findings of my Master Thesis Project, which concludes my master's programme in Management of Technology at the Faculty of Technology, Policy and Management at the Delft University of Technology. This graduation project is part of the "ACHI project: Horticulture in Ghana for a brighter future", which involves a collaboration between the Delft University of Technology, Kwadaso Agricultural College, and Holland Greentech. Last year at the end of the summer, I started this journey, without knowing what would exactly come of it. While this report may be its final product, this graduation project has been far more than just writing a thesis. In hindsight, I cannot overstate the value of the lessons I have learned from every step along the way.

I would like to take this opportunity to express my gratitude towards a few people. First, to Ellen van Andel, who introduced me to the project, and offered me her guidance and positivity in the first months of my research. To Lindsey Schwidder, the project manager, who gave me valuable insights into the purpose of this work and extensive practical advice. To Mr. Samuel Darbah, Mrs. Josephine Darbah, Emanuela, Erika, Josephine and Calvin, I would like to express my deepest gratitude for their incredible hospitality during my stay in Ghana. To Prince Baffour and Theophilus Owusu Anash, for offering me their assistance and accompanying me on several research trips. To Kwadaso Agricultural College, Holland Greentech, and all the individuals who have participated in my research. Your knowledge and perspectives have been invaluable not only for my research, but also for enriching me as a person. To Esther Blom, for being a great travel companion in Ghana, and offering important input on the practical implications of the project. Special thanks to Charlotte Struijk for sharing her experiences with me at the beginning of the project, giving me advice on every aspect of conducting research in Ghana, and supporting me throughout the entire process.

I would also like to express my gratitude towards the members of my graduation committee. Firstly, I am thankful to Victor Scholten for offering me his guidance and wisdom, and keeping me sharp and critical throughout the project. I appreciate Zenlin Roosenboom-Kwee for her detailed and insightful feedback. I would like to thank Gareth Wakeling for his willingness to join the committee at a later stage, and his ability to be so helpful nonetheless.

Finally, to all my friends and family, thank you for supporting me throughout this journey. Whether it was from far away or close by, it is not taken for granted and it truly means a lot.

Now, with that out of the way, all that remains for me is to wish you much enjoyment while reading this report. The experiences that shaped it are truly unforgettable.

*Olav Kuijt*
*Delft, April 2024*

# Summary

Access to finance has emerged as a key area of attention to improve small-scale farming operations, which play a critical role in enhancing livelihoods, reducing poverty and ensuring food security in low- and middle-income countries. In Ghana, agriculture holds substantial economic significance, and the horticultural sector in particular, primarily consisting of smallholders, shows promising potential to improve healthy food production. However, the financing of horticultural smallholders remains notoriously challenging. Commercial banks in Ghana allocate a mere 4% of their total financing portfolio to agriculture, favouring large commodity trading companies, and neglecting smallholders. This disparity emphasises the need for interventions addressing the financing gap experienced by smallholders. Financial inclusion has been identified as a potential strategy to facilitate the transformation of small-scale farmers. However, past policies have fallen short, leaving the majority of Ghanaian agricultural households without formal financial services.

This study is part of the ”ACHI project: Horticulture in Ghana for a brighter future”, which is a collaboration between the Delft University of Technology, Kwadaso Agricultural College (KAC) and Holland Greentech (HGT). The goal of the study is to contribute to the knowledge of financial inclusion of marginalised groups in low- and middle-income countries, by specifically addressing the limited credit provision to commercial horticultural smallholders in the area of Kumasi, Ghana. It is motivated by a lack of qualitative studies on the dimensions of financial inclusion. By explicitly incorporating personal experiences, interpretations and behaviours of both the supply and demand of smallholder agricultural finance, this study presents an in-depth hierarchical model of the factors relevant to financial inclusion, identifies overarching challenges, and suggests pathways for improvement. This may help proponents of financial inclusion and policymakers to devise long-term solutions and strategies, particularly in the context of emerging economies. The study addresses the following research questions:

RQ1: What factors influence the financial inclusion of commercial horticultural smallholders in the region of Kumasi, Ghana?

RQ2: What challenges hinder the financial inclusion of commercial horticultural smallholders in the region of Kumasi, Ghana?

RQ3: What are possible pathways to improve the financial inclusion of commercial horticultural smallholders in the region of Kumasi, Ghana?

For its research design, this study utilises the exploratory case study. Three key research steps give structure to the case. The first two steps cover analyses of both the demand- and supply-side of smallholder agricultural finance in the area of Kumasi, Ghana. The third step compares and integrates the results of the first two steps to increase internal validity, check conformity and highlight overarching challenges. Qualitative data was collected by conducting semi-structured interviews with small-scale horticultural farmers and representatives of local, formal financial institutions. Small-scale farmers were selected on a convenience basis using professional network relations of KAC and HGT. Financial institutions were selected based on their willingness to provide information and anticipated relevance to the provision of financial services to small-scale farmers in the specific geographical context. The qualitative data was analyzed using thematic coding in ATLAS.ti.

The results confirm that access, usage and quality are key dimensions of influence on credit provision, and thus financial inclusion of small-scale horticultural farmers. Within these dimensions, eligibility, affordability, voluntary exclusion, need, capability and suitability were established as relevant factors. Notably, it is observed that financial institutions hold a perception of high risk regarding credit provision to smallholders, which is a result of problems that arise due to information asymmetries and transaction costs. Specifically, the risk of ex-ante moral hazard combined with covariant sectoral risks associated with small-scale agriculture causes an over-reliance on collateral by financial institutions and excessive credit rationing of small-scale farmers. Additionally, the study shows how customer credibility can

undermine the trust of financial institutions, which negatively impacts credit provision and financial inclusion.

Key challenges that are highlighted by this study regarding the financial inclusion of small-scale horticultural farmers are associated with a lack of capability displayed by both financial institutions and small-scale farmers, limited availability of tailored credit products, and a need to implement efficient risk management measures. In light of these challenges, it is required that financial institutions build expertise specific to agriculture and horticulture to be able to develop product and risk management models required in this sector. On the other hand, it is important to strengthen the capabilities of farmers and Farmer-Based Organizations (FBOs) by promoting training in farm economics, financial literacy and business management. Furthermore, tailored credit products that feature affordable interest rates, longer durations and flexible repayment periods could be implemented in combination with effective risk management models. Finally, the insights gained from this study are used to offer some practical recommendations that are focused on the partners active within the ACHI project.

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# Nomenclature

## Abbreviations

| Abbreviation | Definition |
|---|---|
| AFI | Alliance for Financial Inclusion |
| AVCF | Agricultural Value Chain Financing |
| FAO | Food and Agriculture Organisation of the United Nations |
| FBO | Farmer-Based Organisation |
| GDP | Gross Domestic Produce |
| HGT | Holland Greentech |
| KAC | Kwadaso Agricultural College |
| KBI | Knowledge-Based Institution |
| MoFA | Ministry of Food & Agriculture |
| PCG | Partial Credit Guarantee |
| SME | Small and Medium Entreprise |
| SSA | Sub-Saharan Africa |

# 1

# Introduction

The introductory chapter of this thesis lays the foundation for the research that has been performed and is described in further chapters. First, section 1.1 outlines the problem statement, delineating the central issue this thesis addresses. Consequently, section 1.2 identifies the knowledge gap in the existing literature this work aims to contribute to and justifies the academic relevance of this work. Section 1.3 poses the central research questions, that serve as guiding principles throughout this study. Finally, section 1.4 provides an overview of the structure of this thesis, by briefly introducing the subsequent chapters.

## 1.1. Problem statement

Small-scale farming systems play a crucial role in enhancing livelihoods, reducing poverty and ensuring food security in emerging economies (World Bank, 2008b), particularly with the challenges posed by a rapidly expanding population and the increasing influence of climate change (FAO, 2016). However, smallholders face a crucial problem of limited access to credit products, which are essential to adopting improved farming practices and technologies (Goldman et al., 2016; World Bank, 2008b).

In Ghana, agriculture holds substantial economic significance, contributing to almost 20% of the Gross Domestic Product (GDP) (GSS, 2022). Additionally, the sector accounts for over 30% of export earnings (FAO, 2023). It stands as the primary employer, with approximately 36% of the 31 million Ghanaians working in the sector, amounting to 11 million people in total (GSS, 2022). The majority of these individuals are employed within small-scale farming systems (Kwapong et al., 2021).

Horticulture, in particular, plays a significant role in both the domestic and the export market. The sector is experiencing an annual average growth of 10%, compared to the average 3.3% of the broader agricultural sector, emphasising the market opportunities in fruit and vegetable production (Agroberichten, 2023). However, despite this growth, The Global Nutrition Report has indicated that the consumption of vegetables in Ghana is only 46% of the recommended amount for healthy living (Global Nutrition Report, 2022). This can be primarily attributed to high food prices, which can be addressed by increasing production quantity and improving efficiency. However, one of the key barriers to growing the horticultural sector has been identified to be the limited access to finance for small-scale farming operations (Agroberichten, 2023).

The financing of horticultural small and medium enterprises (SMEs), which include small-scale farmers, is notoriously challenging. In Ghana, commercial banks use only 4% of their total financing portfolio for agriculture (Bank of Ghana, 2022). Most of this is short-term and allocated to large commodity trading companies, for example in the cocoa sector (Yeboah et al., 2022). Local banks generally focus on sectors with better risk-return profiles, such as retail banking and real estate. Including these small-scale farmers in high-value commodity chains like fruits and vegetables is a complex challenge, but critical to enhancing youth employment, increasing rural incomes and reducing poverty.

There is increasing evidence that fostering financial inclusion has positive effects at both the household

and macroeconomic levels (World Bank, 2014). Because of this, financial inclusion is a tool with the potential to contribute to the inclusive transformation of the environment of small-scale farmers (IFC, 2011, 2012). Results from the World Bank's Global Financial Inclusion Database indicate an increase in financial inclusion among agricultural producers in some SSA countries, including Ghana (Demirgüç-Kunt et al., 2018) However, Mohammed et al. (2020) found that 56.4% of Ghanaian agricultural households were still without the use of formal financial services in 2020, and although this number is decreasing, this still indicates significant room for improvement.

This study is part of the "ACHI project: Horticulture in Ghana for a brighter future", a follow-up on the Archipelago project, which was funded by the European Union (TU Delft, 2024). The original project, which ran from 2020 to 2022, consisted of a collaboration between TU Delft, Kwadaso Agricultural College (KAC) and Holland Greentech Ghana (HGT), and focused on improving practical education in the field of horticulture and introducing entrepreneurial skills. This was achieved through the development of a tailor-made 4-month training program called: "Farming as a Business", which is offered by KAC for young, motivated people, also outside of KAC. The collaboration continued with a follow-up project, funded by the Dutch embassy in Ghana, and intends, amongst others, to scale up and implement a new training program at several horticultural colleges throughout Ghana, promoting employment and entrepreneurship within the Ghanaian horticultural sector. This study aims to contribute to this project by providing an in-depth overview of the relevant factors and challenges surrounding the financing inclusion of small-scale horticultural farmers in Ghana, which can serve as a benchmark for future strategies, and by using the findings of this study to offer specific recommendations for the partners of the project to improve the access to finance of smallholders.

Furthermore, this study aims to contribute to the knowledge of financial inclusion of marginalised groups in low- and middle-income countries, by specifically addressing the limited credit provision to small-scale horticultural farmers in Ghana. Addressing this challenge is vital for empowering small-scale farmers to enhance their practices, adopt new technologies, and contribute to the growth of the horticultural sector, thereby promoting food security, poverty alleviation, and employment.

## 1.2. Knowledge gap

The existing body of literature concerning financial inclusion primarily focuses on measuring the level to which certain population groups around the world are financially included and tries to establish the role of several socioeconomic characteristics as indicators or determinants. These studies often use quantitative methodologies based on large data sets to accomplish this. This study is motivated by the lack of qualitative data that explores the personal experiences, interpretations and behaviours of specific marginalised population groups in relation to local, formal financial institutions. Furthermore, there are limited studies that employ qualitative methods to specifically explore credit provision to small-scale farmers in lower- and middle-income countries using the dimensions of financial inclusion.

This research contributes to the lack of qualitative studies on financial inclusion by specifying the dimensions of financial inclusion with themes and in-depth insights relevant to the context of credit provision to small-scale horticultural farmers in Ghana. It does so by explicitly taking into account the views of both commercial smallholders as well as local, formal financial institutions, offering a multi-perspective understanding of the issues at hand. It identifies challenges that must be addressed to achieve financial inclusion and suggests possible pathways for improvement. The insights provided by this study can serve as a foundation for proponents of financial inclusion and policymakers to devise long-term solutions and financial inclusion strategies, particularly in the context of small-scale agriculture in lower- and middle-income countries.

## 1.3. Research questions

On the background of the limited provision of financial services to Ghanaian small-scale horticultural farmers by local, formal financial institutions, which is crucial for the development of the horticultural sector, this thesis further explores the complexities that influence smallholder agricultural credit using empirical evidence from the horticultural sector in the region of Kumasi. The study addresses the following three research questions:

RQ1: What factors influence the financial inclusion of commercial horticultural smallholders in the region of Kumasi, Ghana?

RQ2: What challenges hinder the financial inclusion of commercial horticultural smallholders in the region of Kumasi, Ghana?

RQ3: What are possible pathways to improve the financial inclusion of commercial horticultural smallholders in the region of Kumasi, Ghana?

## 1.4. Structure of the thesis

The structure of this thesis is as follows. Chapter 2 contains the results of a literature review, which covers fundamental concepts and definitions. Chapter 3 provides the contextual background of the case study. Chapter 4 contains a detailed description and justification of the case study design utilised in this study and elaborates on the data collection and analysis methods. Chapter 5 offers an overview of the results obtained by the case study. Chapter 6 presents the conclusion of the research by providing the answers to the research questions. Chapter 7 reflects on the results, discusses the limitations of the study and offers several recommendations for further research. Finally, chapter 8 uses the insights gained from this study to offer several practical recommendations that are focused on the partners within the ACHI project.

# 2

# Literature review

This chapter discusses the results of the literature review, that serves as the foundation of this study. Section 2.1 elaborates on the concept of financial inclusion, which fulfils a central role in this study, and provides an overview of its definition and dimensions. Section 2.2 reviews a theoretical perspective on the issues that can occur within credit markets, based on the concept of asymmetric information, and applies this to the context of smallholder agricultural finance. Section 2.3 discusses several characteristics that are commonly used to define commercial smallholders and specifies the definition used in this study. Section 2.4 defines smallholder agricultural finance and outlines its primary uses. Finally, section 2.5 reviews methods that are used to improve smallholder agricultural finance, elaborating on several risk-mitigating and risk-sharing approaches.

## 2.1. Financial inclusion

The central model used in this study is based on the concept of financial inclusion. This section discusses financial inclusion by delving into its background and definition. Subsequently, the dimensions of financial inclusion - access, usage, quality and impact - are characterised individually.

### 2.1.1. Background

The improvement of financial inclusion has been identified as a key strategy in the pursuit of economic development and poverty alleviation (Demirgüç-Kunt & Klapper, 2013; Triki & Faye, 2013; World Bank, 2014). Inclusive financial systems are more likely to benefit poor and underprivileged groups by stimulating investments in productive activities such as entrepreneurship (Honohan, 2008).

Household benefits associated with financial inclusion include increased income, consumption and production levels, along with enhanced employment prospects. Moreover, financial inclusion has been shown to drive investments in education, entrepreneurial ventures, and preventative healthcare measures, while also enabling improved financial management during times of crises such as crop failures or job losses (Demirgüç-Kunt & Klapper, 2013; Demirgüç-Kunt et al., 2018; Nkegbe, 2018). These advantages extend beyond individuals to impact economies, with evidence indicating that financial inclusion positively influences economic growth (Albiman & Bakar, 2022; Bakar & Sulong, 2018).

Despite these recognised benefits, achieving financial inclusion remains challenging, particularly in low- and middle-income countries where only 63% of adults possess a bank account, compared to 94% of adults in high-income countries (Demirgüç-Kunt et al., 2018). Inequality in account ownership within lower- and middle-income countries varies across demographic groups, with small-scale farmers, women, non-unionised workers, and self-employed individuals often excluded from financial services (Demirgüç-Kunt & Klapper, 2013; Demirgüç-Kunt et al., 2018; Triki & Faye, 2013).

### 2.1.2. Definitions and dimensions

In essence, financial inclusion aims at drawing the ”unbanked” population into the formal financial system so that they have the opportunity to access financial services ranging from savings, payments and

transfers to credit and insurance (Hannig & Jansen, 2010). The concept of financial inclusion initially emerged as a simple classification of individuals and enterprises being either included or not. However, growing recognition of the benefits associated with financial inclusion has sparked an increase in studies aimed at measuring and understanding the factors that influence it (Demirgüç-Kunt et al., 2018; Sarma & Pais, 2011; Triki & Faye, 2013).

The shift towards the development of a more comprehensive and multidimensional definition of financial inclusion is crucial. It helps to move beyond the assumption that inclusion will automatically follow from an increase of access points (Triki & Faye, 2013). Instead, a holistic understanding of financial inclusion should speak to how frequently clients use products, if the products effectively meet their needs, and if users are better off as a result.

Official definitions of financial inclusion remain sparse and unstandardised (Tissot & Gadanecz, 2017). Financial inclusion has been defined as ”the ease of access, availability and usage of the formal financial system for all members of an economy” (Sarma & Pais, 2011, p. 613). According to the World Bank (2022), financial inclusion means that ”individuals and businesses have access to useful and affordable financial products and services that meet their needs – transactions, payments, savings, credit and insurance – delivered in a responsible and sustainable way” (p. 1). While definitions may vary, the indicators of financial inclusion generally align with the following four key categories, referred to as dimensions, without being restrictive:

1. Access
2. Usage
3. Quality
4. Impact

In a hierarchical sense, access, usage, and quality represent dimensions observed to be causal indicators, while impact serves as an indicator for evaluating the outcomes of financial inclusion. This has been summarised in figure 2.1.

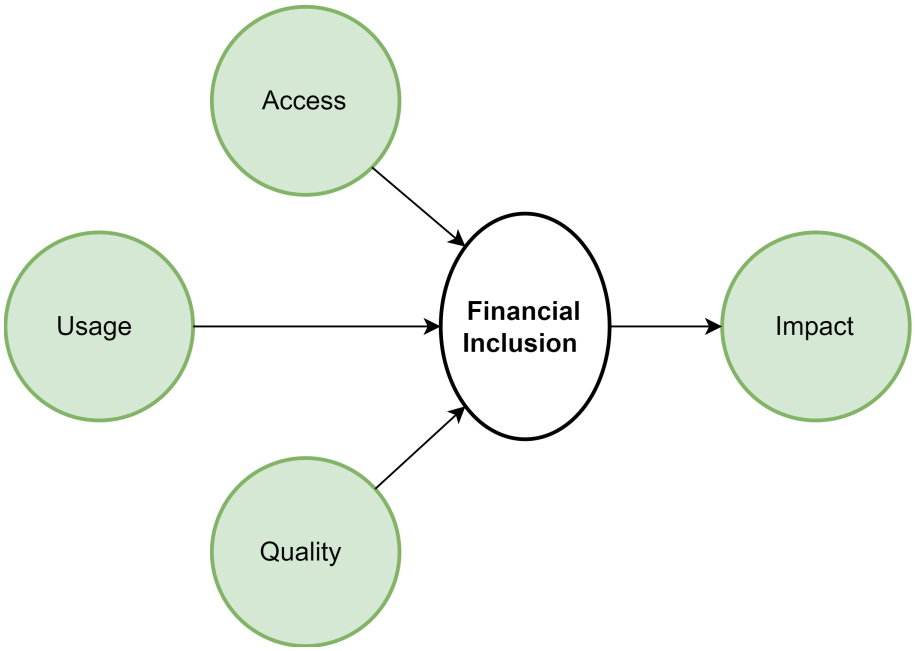


**Figure 2.1:** A hierarchical model of the dimensions of financial inclusion, adapted from Okello Candiya Bongomin and Munene (2020), p. 363.

The dimensions of financial inclusion are characterised individually.

### Access

Access to financial services has received relatively much attention in the effort to achieve greater financial inclusion (Hannig & Jansen, 2010; Tissot & Gadanecz, 2017; Triki & Faye, 2013; Yakubu et al., 2017). According to Claessens (2006), access to finance can be defined as the "availability of a supply of reasonable quality financial services at reasonable costs, where reasonable quality and reasonable cost have to be defined relative to some objective standard, with costs reflecting all pecuniary and non-pecuniary costs" (p. 210). Additionally, World Bank (2007) defines access simply as "an absence of obstacles to the use of these services, whether the obstacles are price or nonprice barriers to finance" (p. 2). Therefore, the access dimension is primarily concerned with the ability to use financial services that are available from formal financial institutions.

Beck et al. (2009) observe that especially in rural areas there should be ease of physical access to banks, flexibility of service provision, and reliability of the financial services providers. The World Bank (2007) elaborates that physical access, eligibility requirements, and affordability are the major determinants of access to financial services by the poor in emerging economies.

Thus, ease of physical access, the eligibility requirements of financial products, and their affordability are components of access that significantly promote financial inclusion of the poor in emerging economies. While access essentially refers to the supply of services, actual usage of a service is determined by demand as well as supply (World Bank, 2007).

### Usage

The usage of financial services involves the actual consumption of the particular financial services offered by financial institutions that one has access to (Claessens, 2006). There is an important discrepancy between access to financial services and use, which is associated with the difference between voluntary and involuntary exclusion.

The following explanation is based on Claessens (2006) and World Bank (2007), and summarised in figure 2.2: first, users can be distinguished from non-users of formal financial services. The use of financial services implies that one has access to those financial services. Second, a distinction is made within the non-user segment. On the one hand, some do not use financial services because they might not need them, or due to cultural, religious, or psychological reasons. These people voluntarily exclude themselves from using financial services, though they might have access to them, which means non-usage does not imply not having access. On the other hand, there are people who, despite demanding financial services, have no access to them. They are involuntarily excluded.

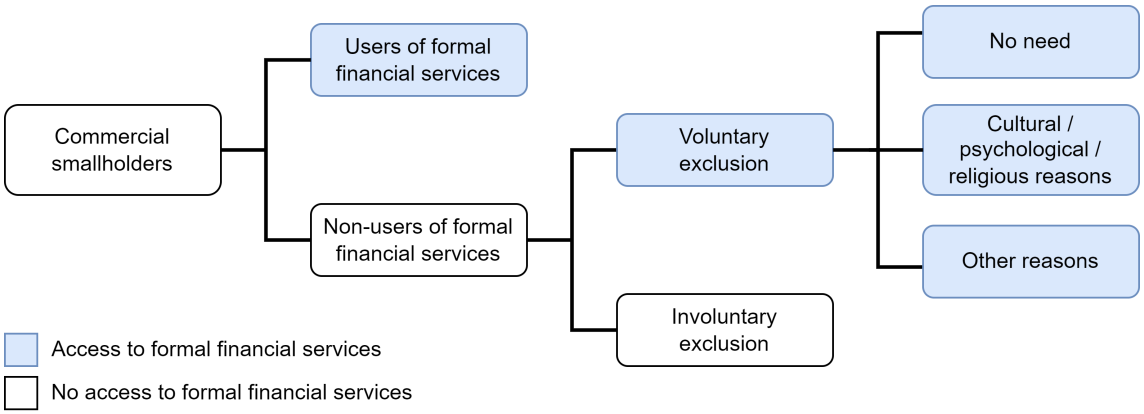


**Figure 2.2:** Distinguishing between access to finance and use, adapted from World Bank (2007), p. 29.

It can be recognised that from a policy and strategy perspective non-users who voluntarily exclude themselves from financial services do not constitute a major problem because they are driven by a fundamental lack of demand (Claessens, 2006). Finally, individuals may voluntarily exclude themselves due to a lack of awareness regarding the existence of financial services and their benefits, or because of psychological factors such as risk aversion. Risk aversion can attributed to character or culture, but can also originate from inadequate education, also referred to as a lack of financial capability. In these

instances, providing financial education could stimulate demand, and it's imperative not to neglect this group of people from a policy perspective. Thus, themes relating to need, voluntary exclusion and capability can be major determinants of the usage of financial services.

#### Quality

Quality relates to the nature and depth of the relationship between financial institutions and consumers. It features the choices available to customers, their understanding of those choices and their implications (ACCION, 2011). Thus, quality refers to the relevance of the financial service or product to the lifestyle and characteristics of the consumer (Hannig & Jansen, 2010). Likewise, it also encompasses choices of financial service providers concerning the customers and their levels of understanding of those choices and their implications. Examples of themes under the quality dimension are therefore perceived usefulness of a product by the customer, customer satisfaction and the suitability of a financial product to a specific customer.

#### Impact

The dimension of impact categorises indicators that evaluate the outcomes of financial inclusion. It captures the changes in the lives of consumers that can be attributed to the usage of a financial service (Hannig & Jansen, 2010). It is based on the assumption that people who enjoy financial inclusion may experience improvements in their livelihoods. Impact involves the outcome that a financial service has on the lives of the poor, including changes in consumption, business activity, and welfare (World Bank, 2008a).

Research that studied the impact of credit access on specifically agricultural business development shows evidence of a positive relationship between loan usage and technology adoption among small-scale farmers (Tadesse, 2014), which could improve agricultural productivity and contribute to sustainable agricultural intensification (Asante-Addo et al., 2017). Limited access to credit affects the ability of farmers to purchase quality inputs and make farm-related investments (Reyes & Lensink, 2011), and may also influence their risk behaviour (Nielsen et al., 2013). In particular, farmers that don't have access to credit will undertake investments in less risky and less productive technologies, rather than in more risky, productive ones (Dercon, 1998).

However, positive causal links between credit and agricultural output and productivity are not without any dispute. Quartey et al. (2012) emphasise the complementary view that agricultural credit may only succeed if the actual profitability of a farm is improved. They point to other essential determinants of farm profitability, specifically efficient pricing and marketing, that need to be taken into consideration to avoid loanable funds disappearing into bad debts. Also, concerning the assumption that financial inclusion will improve welfare, Villarreal (2018) concludes that evidence on the impact of financing on household and individual welfare remains inconclusive. The study highlights that evidence on this matter can be difficult to compare as a large variety of methodologies are used to measure impact. However, it is confirmed that credit products hold the potential to stimulate investment and create new income, concluding that enabling finance for small-scale farmers can be viewed as a stimulant for the growth of low-income population segments, which in turn could mitigate deficiencies in essential areas like housing and food.

## 2.2. Asymmetric information in credit markets

The explicit problems with access to financial services and its distinction with usage, outlined in subsection 2.1.2, appear to be more emphasised in credit markets, especially in rural contexts of lower- and middle-income countries. A strand of literature that focuses on the theory of asymmetric information, originating from Stiglitz and Weiss (1981), offers a theoretical perspective on the characteristics that differentiate credit markets and relates this to access and usage problems. More specifically, it describes how information asymmetries can lead to adverse selection, moral hazard, and ultimately credit rationing by the lender.

### 2.2.1. Adverse selection and moral hazard

The basic rules of economics state that the price of a product will be adjusted until an equilibrium is reached where the demand for a product equals its supply. That would mean that all who are willing to pay the resulting price for the product would be able to use it, and there would be no access problem.

However, Stiglitz and Weiss (1981) argue that credit markets are different because of (1) the information asymmetries that exist between the lender and the borrower, and (2) the fact that the interest rate of a loan may not only represent its price but also affect its riskiness. This happens either because of the sorting of potential borrowers, defined as the adverse selection effect, or the actions of the borrowers being affected, which is called the incentive effect and may result in moral hazard.

Adverse selection is a consequence of the fact that different borrowers will have different probabilities of repayment. The bank's expected return will depend on the probability of a borrower repaying their loan. However, private borrowers may have personal information about the profitability and risk of their behaviour and/or project they want to embark on, thus information asymmetries arise. The bank wants to identify good borrowers, for which it can use several screening devices, including interest rates. However, those who are willing to pay a higher interest rate may, on average, be more risky; they are willing to take higher risks to gain higher returns, which makes them accept a higher interest rate. However, higher risks are also associated with a higher probability of failure, making it more likely that their loan will default.

Furthermore, changes in the contractual requirements, like interest rate or collateral requirements, may also incentivise specific behaviour of the borrower. In particular, higher interest rates can lead to moral hazard, where the borrower will undertake riskier projects with a lower probability of success, but higher payoffs. Although several definitions of moral hazard exist, this study refers to the economic variant. In this definition, a distinction can be made between ex-ante moral hazard and ex-post moral hazard.

Ex-ante moral hazard takes place before a project is finished, and relates to the idea that borrowers might take unobservable actions that may not be optimal for the potential returns of a project. A possibility could be that the borrowers do not use the acquired capital to maximise their project's profits, or even at all for the agreed purposes, whether these alternatives may be profitable or not, which is referred to as a diversion of funds. This problem occurs after the loan has been disbursed since the lender cannot reasonably control the exact way in which a borrower will use the loan.

Ex-post moral hazard happens after a project is finished, and defines the situation where the borrower might withhold information, for example about the project's returns, from the lender, or simply take the realised proceeds and run away from the lender, defaulting the loan in the process. Moreover, borrowers could make false claims about their returns if they can't be verified by the lender.

When asymmetric information leads to adverse selection and moral hazard problems, the expected repayment rates may decrease and result, also the expected rate of return of a bank. The acquiring of additional information through extensive screening and monitoring of borrowers may be too costly, and a bank may not want to scare away safer borrowers by increasing the interest rate. In this case, to reduce the risk of its portfolio, a bank may opt to just reduce the quantity of the loans it gives out, a phenomenon described as credit rationing. While credit rationing leads to the involuntary exclusion of potential customers that have a demand for credit (Jansson et al., 2013), it can be seen as a rational market response on the supply side (Claessens, 2006).

This analysis of the credit market goes against the classical teachings of supply and demand. When there is an excess of demand for loans at a certain interest rate, classical economic theory would suggest the bank to simply increase its price, i.e. the interest rate, until the demand is equal to the supply, visualised as $r^{eq}$ in figure 2.3. However, in the case of asymmetric information, the lender may opt to keep the interest rate below the equilibrium, as it would allow them to secure a preferable risk composition of projects, see $r^*$ in figure 2.3. In this case, the demand will exceed the supply, the interest rate will not rise as a result, and consequently, credit rationing will occur.

It is worth noting that determining whether an individual has access to financial services but decides not to use them or was rationed out is complex. Also, the effects of adverse selection and moral hazard are very hard to separate empirically (Karlan & Zinman, 2005).

So what about other financial services like deposit or payment services, which do not suffer from information problems? Why do these areas of finance suffer from access problems? For these types of services, non-price barriers become more important (World Bank, 2007). For example, lacking proximity of financial institutions might cause the inability of rural farmers to access financial services. Also, high transaction costs for lenders might make them too expensive to offer them in the first place. Poorly

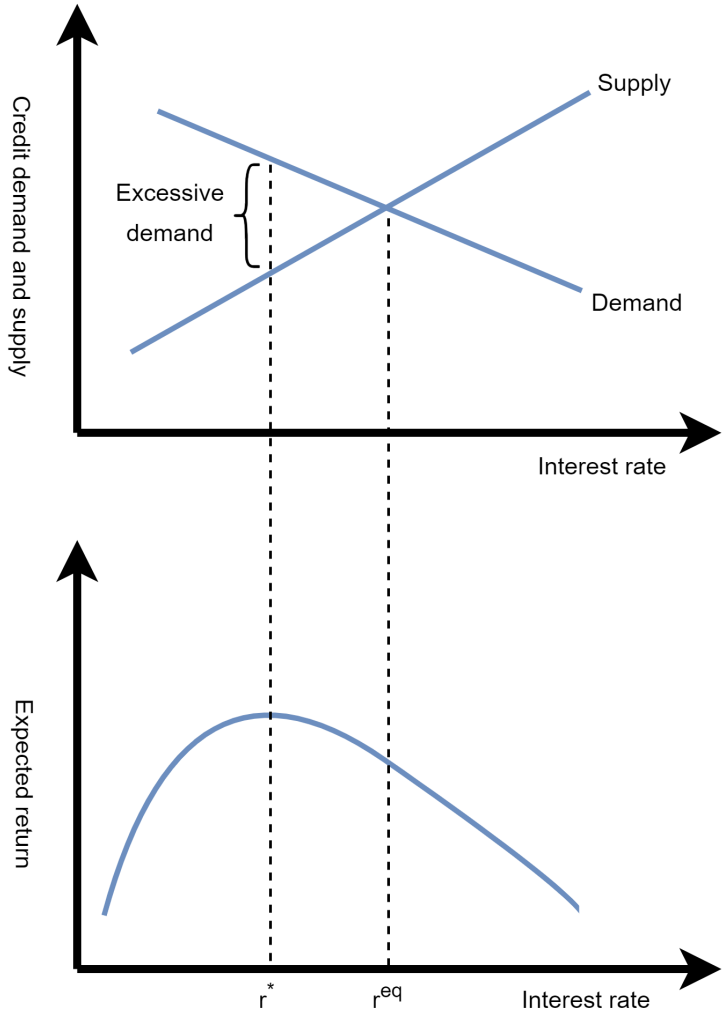


**Figure 2.3:** Credit rationing in a competitive market, adapted from Stiglitz and Weiss (1981), p. 394.

designed regulatory requirements may also exclude those who do not meet the documentation requirements. Some would-be customers might be discriminated against for a particular reason.

The price can also be a barrier. Even when non-price barriers are overcome, the equilibrium price for financial services (like fees, minimum requirements, etc.) may be very high, making them unaffordable for a part of the population. Since no rationing is occurring, this indicates a different kind of access problem. These high prices are often caused by a lack of competition or underdeveloped physical or institutional infrastructures, leading to financial exclusion.

### 2.2.2. The context of smallholder agricultural finance

The three problems stemming from asymmetric information - adverse selection, ex-ante, and post-ante moral hazard - seem to be especially pronounced in the context of smallholder finance. While the fundamental information asymmetries that lie at the foundation of these problems might be overcome by customer screening and loan monitoring (Westercamp, 2010), these processes are often more challenging or less effective in the context of smallholders due to the high associated transaction costs. These transaction costs are caused by the large distances that exist between clients, lacking infrastructure, a sometimes insecure regulatory environment, and low financial literacy among borrowers. Especially, large financial institutions in urban areas face difficulties when acquiring the needed field-level information.

In microfinance or smallholder agricultural finance, the transaction costs also increase because lenders need to manage many small transactions instead of one larger transaction (Armendáriz & Morduch, 2010). Furthermore, appropriate sanctioning mechanisms are often hard to establish due to borrowers being unable to provide adequate collateral and, even when that is possible, contracts being difficult to enforce due to the weak judicial systems that are often found in lower- and middle-income countries. Finally, agricultural smallholder finance is made more challenging due to some inherent sectoral characteristics. The methods used in small-scale agricultural production are subject to covariant risks like weather patterns, pests and diseases, and market price volatility, which may affect a large group of borrowers at the same time.

In summary, problems stemming from information asymmetries found in credit markets, like adverse selection, ex-ante, and post-ante moral hazard are exacerbated in the context of credit provision for smallholders in lower- and middle-income countries, where individuals are not able to offer adequate collateral, transactions are costly, and legal enforcement mechanisms are weak.

## 2.3. Defining commercial smallholders

This section defines the subgroup of smallholder farmers that, alongside formal financial institutions, serve as the main focus groups of this study. However, it is crucial to acknowledge that not only this subgroup, but all smallholder farmers may require financial services, as the entirety of this group generally has yet to gain access to formal financial services (Striegel, 2015).

There is no clear definition of what constitutes a smallholder or small-scale farmer. While a lot of different characteristics can be used for this definition, this study chooses to focus on commercial farmers who cultivate at least one horticultural cash-crop, on a plot of up to 5 hectares, and consider farming their primary business activity. The cash crop(s) may be intercropped with other non-horticultural crops for diversification or subsistence purposes. Figure 2.4 correctly summarises the characteristics of this segment. This sub-group of small-scale farmers is referred to as commercial horticultural smallholders.

Although often the word smallholder is chosen to categorise this subsegment of farmers, this study will explicitly focus on ”commercial smallholders” to emphasise the commercial aspect that characterises these farmers and resolve any ambiguity with subsistence farmers, which is also commonly referred to as smallholders (Chamberlin, 2008).

Smallholder farmers, in general, own relatively small plots of land on which they grow subsistence crops and cash crops, relying primarily on manual labour and rainfall. The main characteristics of the production systems of smallholder farmers are limited use of technologies, low returns and high seasonal labour fluctuations (Peprah et al., 2020a).

The definitions of smallholder farmers vary significantly and can depend on a large number of char-

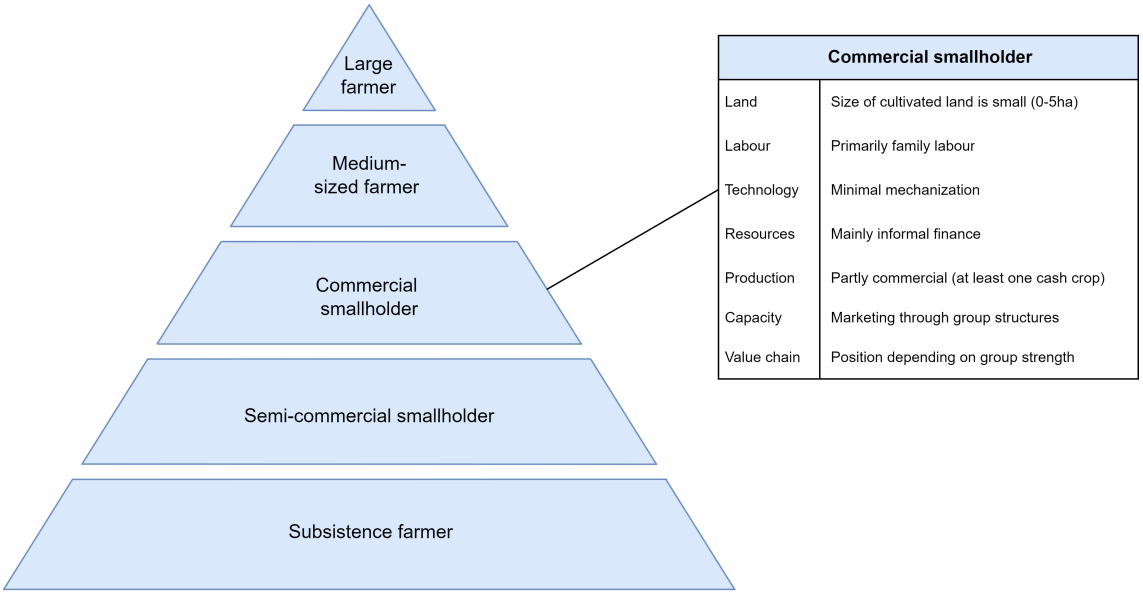


**Figure 2.4:** Farmer segmentation and key characteristics of commercial smallholders, adapted from IFC (2011), p. 16.

**Figure 2.5:** Small-scale farmer in the region of Kumasi manually irrigating his plot, own image.

acteristics (Chamberlin, 2008). The main themes that are used consist of farm area or holding size, wealth, market orientation and levels of vulnerability to risk. Categorization based on revenue is an option but can prove to be problematic. Categorization based on revenue can be especially challenging due to fluctuating commodity prices and circumstances like weather, leading to significant revenue variations from year to year (Striegel, 2015), and lack of records made by farmers. However, the term ”smallholder” typically denotes limited land availability, fragmented holdings, and restricted access to credit (Chamberlin, 2008).

The land size threshold is used by many countries to categorise farmers. This study, in agreement with Kwapong et al. (2021), follows the land size categorization in the 2016/2017 Ghana Living Standards Survey (GSS, 2017). Small-scale farms are categorised as having farm areas less than 5 ha, medium-scale farms have farm areas between 5 and 100 ha, and large-scale farms have farm areas over 100 ha. This is confirmed by Ekboir et al. (2002) who state that a smallholder in any part of Ghana is a farmer who farms on less than 5 hectares

Fan et al. (2013) use a typology for commercial smallholders as producers who are already involved in profitable agricultural activities but are held back from scaling up their commercial activities by factors such as limited access to capital and risk-reducing tools. Additionally Fan et al. (2013) critiques the classification of small-scale farms as a homogeneous group, by shedding light on differential variations that exist among small-scale farms. Peprah et al. (2020a) also emphasise that resource-poor households are a diverse group of people.

## 2.4. Smallholder agricultural finance

This study focuses on the credit provision to commercial smallholders, who fall under agricultural SMEs. This section explains and emphasises the differences between this type of finance and rural finance, microfinance and agricultural finance, and elaborates on its main uses and characteristics.

### 2.4.1. Definitions and segmentation

Within the overall financial sector, we can divide three categories that are relevant for the rural population and low-income households in lower- and middle-income countries: microfinance, rural finance and agricultural finance (Pearce, 2003). These will be explained separately.

#### Rural finance

Rural finance is a spatial concept that defines itself not with a specific target group, but by geographical location, specifically rural areas, where its financial services are provided to the population at all income levels (IFC, 2011). Because farming often takes place in rural environments, the assumption is easily made that rural finance and agricultural finance are the same. However, rural finance also encompasses non-agricultural activities in rural areas.

#### Micro finance

Microfinance relates to the provision of financial services such as small loans, savings accounts, insurance and payment services to a specific target audience of low-income individuals or groups that would otherwise have no other means of gaining access to those services. This includes urban, semi-urban and rural contexts.

#### Agricultural finance

Agricultural finance is based on the agricultural sector and refers to financial services that are designated to support the agricultural value chain from production to marketing. This often coincides with rural finance, due to the rural nature of agriculture, but is not limited to it. One of the key attributes of agricultural finance is its proneness to a set of unique, sector-based risks such as weather hazards, pests and diseases, and price fluctuations.

This study focuses on the provision of credit to the specific group of small-scale horticultural farmers, visualised in figure 2.6, which can described by a subset of agricultural microfinance focused on smallholders that may or may not be located in rural areas. This will be referred to as smallholder agricultural finance.

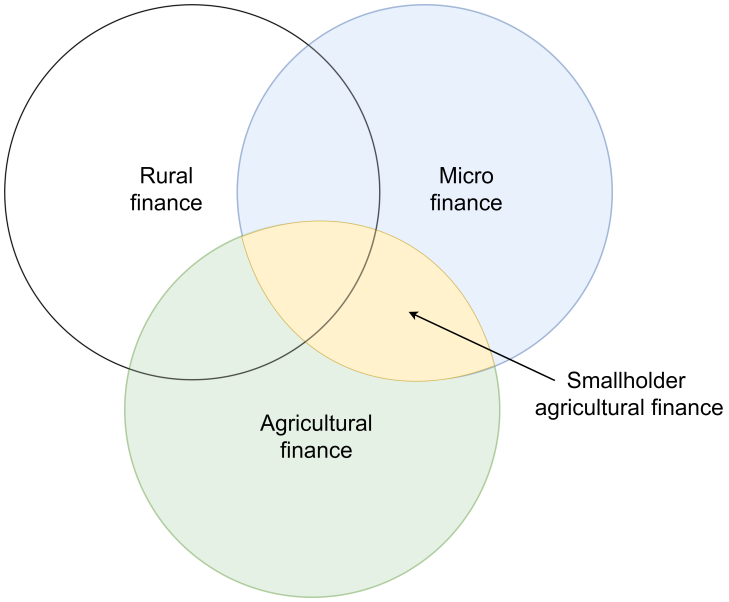


**Figure 2.6:** Defining the subset of smallholder agricultural finance, adapted from Pearce (2003), p. 1.

### 2.4.2. Primary uses

While the demand for financial services differs with the level of commercialization and the size of commercial smallholders, they usually require a fixed set of different financial services to support their agricultural business (Striegel, 2015). The characteristics of these uses may influence the risk perception of financial institutions. The different credit products can be distinguished by the length of the loan arrangement, and the point in time during the crop cycle at which the funds are disbursed (pre- or post-harvest):

1. Pre-harvest input finance

This relates to loans needed to obtain pre-harvest capital used for agricultural inputs like fertiliser, herbicides and seeds, or to hire labour to work on the farm, especially during labour-intensive periods like planting and harvesting. These loans typically last up to twelve months.

2. Pre-harvest equipment finance

This concerns larger-sized loans used to finance investments that are needed to improve production systems or equipment, like tractors, irrigation and postharvest technologies. These arrangements can last up to 60 months (5 years).

3. Post-harvest marketing finance

These loans relate to finance required by crop collectors (producer groups, cooperatives or traders) to facilitate the marketing of the produce. These are often short-term loans that last up to twelve months.

However, apart from these three categories, other financial services might also be desired by smallholders. These include payment services, insurance, savings schemes but also loans for non-agricultural purposes like food, school fees, other health-related expenses or emergency expenses like funerals. The perceived risk and return levels may differ depending on the service or scheme.

The availability of credit options for small-scale farmers varies depending on several factors that can be different based on the specific country or crop involved. Considerations can be attributed to, for example, the risk associated with agricultural production, the borrowers' credit history, and the financial institutions' willingness to support small-scale agriculture. Additionally, factors such as the nature of the crop and its production cycle also influence credit availability. However, there seems to be a tendency among financial service providers to perceive pre-harvest credit as higher risk due to the unique production risks involved, compared to post-harvest finance needed for activities like processing and marketing (Striegel, 2015). Consequently, accessing credit is typically most challenging for smallholder

producers, particularly for long-term investment loans. In contrast, larger-scale agricultural processors, commodity traders, and producers with higher levels of commercialization generally find it easier to access financial services, while smallholders encounter various barriers in meeting eligibility criteria set by formal or semi-formal financial institutions (Striegel, 2015). Figure 2.7 lays out the general risk patterns of different credit arrangements along the agricultural value chain.


**Figure 2.7:** Risk levels in agricultural finance, adapted from Striegel (2015), p.9.

## 2.5. Approaches to improve smallholder agricultural finance

This section provides an overview of several selected approaches and strategies that have been developed to improve access to sustainable smallholder finance. It elaborates on their advantages, as well as their challenges. The selected approaches are categorised under risk mitigation and risk sharing (Caroll et al., 2012; IFC, 2011, 2012).

### 2.5.1. Risk mitigation

Risk-mitigating approaches have the goal of reducing the frequency or impact of an identified risk. Risk-mitigating measures associated with FBOs, credit insurance and index-based insurance are discussed.

#### Farmer-based organisations

One approach to scaling up smallholder agricultural finance by stimulating the aggregation of smallholders in Farmer-Based Organisations (FBOs). While the vast majority of smallholders do not participate in FBOs, they hold the potential to strengthen the position of its members in their value chain (Caroll et al., 2012), unlocking a multiple of benefits. For example, Quartey et al. (2012) highlight the influence of enhanced bargaining power of FBOs on improving the pricing and marketing of their produce. Furthermore, from a lender's perspective, the transaction costs of dealing with multiple non-aggregated farmers can be avoided when only a single intermediary, like an FBO, has to be addressed. However, there remain big organization challenges to aggregate small-scale farmers into FBOs (Striegel, 2015).

#### Credit insurance

Another development in agricultural credit markets pertains to credit insurance. Financial institutions may mitigate risk by combining credit products with crop insurance (Striegel, 2015). Crops insurance can protect loans which default because of weather hazards or pests and diseases (Choudhury et al., 2022). However, the individual assessment of on-site crop losses contributes to problems of moral hazard and high transaction costs. These costs are either passed on to the borrower or need to be compensated with subsidiaries (IFC, 2011).

#### Index-based insurance

A recent innovation in agricultural credit markets is index-based insurance, which releases payments in case of deviations from a pre-determined indicator, e.g. a certain level of rainfall, which is specifically known as weather-index insurance. There is evidence that supports the potential of index-based insurance to reduce the transaction costs that are associated with on-site assessments and mitigate the problem of moral hazard (Dougherty et al., 2021). However, possible mismatches between payouts and actual losses are possible if the correlation between index and farm level yields is not high enough (basis risk) (IFC, 2012). Also, there may be significant differences between the data collected by a local weather station and the circumstances at a farm, or between farms, due to micro-climate effects, emphasizing the need for high-quality data availability. Furthermore, the additional costs required to

develop these products often need to be passed on to borrowers which reduces their affordability (IFC, 2011). In any case, crop insurance products can be a crucial factor in relaxing constraints for small-scale farmers to invest in their production system or equipment, since they would be insured against risks like crop failures.

### 2.5.2. Risk sharing

Risk-sharing approaches try to improve lending to smallholders by sharing the risk among stakeholders instead of reducing them. Two risk-sharing approaches - agricultural value chain financing and partial credit guarantees - will be discussed.

#### Agricultural Value Chain Financing

Agricultural Value Chain Financing (AVCG) refers to financial arrangements and cash flows between different stakeholders within the agricultural value chain (internal value chain financing) or financial institutions which are not part of the value chain (external value chain financing). The concept uses the flow of finance and information between value chain actors to alleviate financial constraints (Miller & Jones, 2010). The fundamental idea is that actors can use business relationships and arrangements between trusted parties as soft collateral to share risk between parties (Villalba et al., 2023). However, the highly context-specific nature of value chain interventions poses a conceptual and practical challenge to this method (Hainzer et al., 2019).

#### Partial credit guarantees

Partial credit guarantees (PCGs) distribute the credit risk through an agreement with a third party, a credit guarantor who (partially) guarantees selected loan facilities within the financial institution's portfolio (Beck et al., 2010). PCGs stimulate financial institutions to provide credit, especially in cases where they deem the risk too high to offer it. It is important to emphasise that credit guarantees should only cover part of a loan to ensure the commitment of both the lender and the borrower to avoid moral hazard and adverse selection. Furthermore, the guaranteeing schemes should not be disclosed to the borrower to avoid, once again, moral hazard due to the decrease in their risk exposure.

# 3

# Case context

This chapter describes the contextual background of the case study central to this work. Section 3.1 provides a description of the ACHI project, to which this study contributes, and the partnerships it embodies. Section 3.2 elaborates on the importance and challenges of developing small-scale horticulture in Ghana, and outlines the role of financial inclusion within this process. Section 3.3 offers a summary of the past national policies surrounding financial inclusion and describes how they fell short of success. Section 3.4 explains the rationale behind the focus on small-scale horticultural credit provision in the case study. Section 3.5 provides some context on the current financial landscape seen in Ghana. Finally, section 3.6 presents relevant background information on the particular setting of the research, being the region of Kumasi in Ghana.

## 3.1. ACHI project and partnerships

As described in section 1.1, this thesis is part of the ”ACHI project: Horticulture in Ghana for a brighter future”. This section elaborates on the background of this project as well as its partners.

”ACHI project: Horticulture in Ghana for a brighter future” is a collaborative effort between TU Delft, Kwadaso Agricultural College (KAC) and Holland Greentech Ghana (HGT) (TU Delft, 2024). KAC, located in Kumasi, is Ghana’s oldest and leading agricultural institution and offers degrees in general agriculture and agricultural extension. HGT is a Dutch supplier of agricultural knowledge, inputs and extension services in several African countries, including Ghana. For the Archipelago project, which ran from 2020 to 2022, these organizations teamed up with the TU Delft to develop a new training program for KAC. The Archipelago study program is designed for professionals who want to start a business in the horticultural sector. Its curriculum can be seen as a bridge between entrepreneurship and farming.

Since 2022, the collaboration between TU Delft, KAC and Holland Greentech Ghana has continued, now funded by the Dutch embassy in Ghana. From January 2024 this project has been operating under the name ”ACHI project: Horticulture in Ghana for a brighter future”. It intends, amongst others, to scale up and implement a new training program at several horticultural colleges throughout Ghana, promoting employment and entrepreneurship within the Ghanaian horticultural sector. The project has resulted in improved campus demonstration farms, see figure 3.1, and greenhouses, and the inclusion of business plan development in the curriculum. Also, the collaboration between KAC and a selection of ”lead farmers” is incorporated. These farmers implement best practices for growing and marketing produce with the assistance of KAC and HGT, and share this knowledge with other farmers. This study utilises the professional network relationships between KAC, HGT and several farmers in its participant selection, which is further explained in section 4.3.

## 3.2. Setting the scene

This section elaborates on the background on which the case study is conducted, highlights the importance and challenges of developing small-scale horticulture in Ghana, and emphasises the role of

**Figure 3.1:** Students working on a demo plot on the campus of Kwadaso Agricultural College (KAC), own image.

financial inclusion within this process.

Most of the population in Africa depends on agriculture, particularly small-scale farming, as the primary source of their livelihood (Nosipho Hlophe-Ginindza & Mpandeli, 2021). Ensuring food security and poverty reduction in many African countries depends largely on the growth and development of the agricultural sector (World Bank, 2005).

Ghana can be described as a typical African country in this regard. Almost 20% of the GDP is linked to agriculture (GSS, 2022) and agriculture accounts for over 30% of export earnings (FAO, 2023). Furthermore, the agricultural sector is the biggest employer in Ghana. Roughly 36% of the 31 million Ghanaians are working in the sector amounting to 11 million people in total (GSS, 2022).

The horticultural value chain in particular plays a significant role both for the domestic and the export market, and the sector is growing on overage by 10%. Compared to the average of 3.3% of the broader agricultural sector, the market opportunities in fruit and vegetable production are significant (Agroberichten, 2023).

Furthermore, the Global Nutrition Report indicated that the consumption of vegetables in Ghana is only 46% of the recommended amount for healthy living. On average, a person should consume a minimum of 400 grams of fruits and vegetables per day (FAO/WHO). In Ghana, not even the intake of 200 grams is currently being met. This is partially caused by the relatively high prices of vegetables and fruits. The Ghana Living Standards Survey indicated that 13% of total food expenditure is going to vegetables, mainly tomatoes (36%), onions (19%) and chillies (10%). One important way to tackle high food prices is to start producing more, and more efficiently. However, to grow the horticultural sector, one of the key areas of attention to improve is the access to finance for small-scale farming operations (Agroberichten, 2023).

The financing of horticultural small and medium enterprises (SMEs), which include small-scale farmers, is notoriously challenging in Ghana. Commercial financing to the agricultural sector in Ghana is estimated at 4% of the total financing portfolio of banks (Yeboah et al., 2022). Local banks generally focus on sectors with better risk-return profiles, such as retail banking and real estate. Most commercial financing to the agricultural sector is short-term and allocated to large commodity trading companies,

for example in the cocoa sector. Informal investors (i.e. family and friends) are the most important source of financing for horticultural SMEs, followed by the Government and grant initiatives from donor communities.

With regards to financial inclusion, Mohammed et al. (2020) found that a majority (56.4%) of Ghanaian agricultural households used no formal financial services, though progress has been made. Results from the World Bank's Global Financial Inclusion Database indicate an increase in financial inclusion among agricultural producers in some SSA countries, including Ghana (Demirgüç-Kunt et al., 2018). It was found that agricultural producers are increasingly using transaction services for receipt and payment activities (Demirgüç-Kunt et al., 2018). While this is an improvement, efforts must be geared toward increasing the use of all financial services as they work together to contribute to increased productivity and work efficiency.

## 3.3. Former policies on financial inclusion

To increase access to financial services in the agricultural sector, Ghanaian lawmakers have developed and implemented various policy schemes and strategies. For example, the Agricultural Bank of Ghana was established in the 1960s to increase financial access to agricultural producers. As of 2010, however, only 29% of its lending went to agriculture (AgriFin, 2012). Similarly, Ghana has implemented financial regulations requiring commercial banks to set aside 20% of the value of their total portfolio for use in promoting lending to agricultural and other small-scale industries (Asiama & Osei, 2007). As of 2010, only 6% of commercial banks' lending had gone to the agricultural sector (AgriFin, 2012).

By many accounts, these policy schemes and strategies have failed Ghana's agricultural sector. Consequently, rural and community banks have also been established to provide financial services to rural areas (Nair & Fissha, 2010). These banks are locally owned and managed. They are supervised by the Association of Rural Banks Apex Bank (as the clearing bank) under the regulations of the Bank of Ghana, which owns shares in the banks (Awunyo-Vitor et al., 2014). Similar to previous development strategies, only 9% of lending from these institutions had been used for agricultural purposes as of 2010 (AgriFin, 2012). These inefficient policy schemes, which have focused primarily on increasing access to financial institutions, highlight the persistently low levels of financial inclusion that have plagued Ghana's agricultural sector.

## 3.4. Case study rationale

The section justifies the decision to adopt specific focus points within the case study. In particular, the focus on commercial horticultural smallholders, and credit provision are addressed.

As outlined in section 3.2, the small-scale agricultural sector in Ghana is essential for food security and poverty reduction. However, horticulture in particular, being high-value and contributing significantly to a healthy diet, holds major market opportunities, which justifies a specific interest. As defined in section 2.3, this study focuses on commercial smallholders within the horticultural sector. Commercial smallholders contribute substantially to production, income generation, and employment (World Bank, 2008b). Furthermore, these farmers are more likely to adopt improved farming practices, technologies, and inputs, which often require upfront investments and access to credit (Tadesse, 2014).

According to Dev (2006), credit is the most critical component of financial inclusion. Credit plays a vital role in increasing agricultural production and allowing the acquisition of necessary inputs and machinery for farm operations (Rehman et al., 2017). It allows farm households to better utilise both working and fixed capital, as they can invest in better inputs and improve agricultural practices (Martey et al., 2019). This helps to improve the standard of living as households can purchase necessities and even out consumption (Rehman et al., 2017).

Therefore this study chooses to study financial inclusion with a particular focus on credit products, of commercial horticultural smallholders in the region of Kumasi, Ghana.

## 3.5. The financial landscape of Ghana

In Ghana, the credit supply to agriculture is the responsibility of financial institutions that fall into three main categories: formal, semi-formal and informal (Abdallah, 2016).

Formal financial institutions are incorporated under the Companies Code 1963, which gives them legal identities as limited liability companies, and subsequently licensed by the Bank of Ghana (BoG) under either the Banking Law 1989 or Non-banking financial institution law 1963 to provide financial services under BoG regulation (Abdallah, 2016). The formal finance sector is made up of commercial banks, which are normally within urban areas; and for the rural areas, there are Rural Community Banks (RCBs) and their associations.

Ghana's semi-formal financial sector consists of Savings and Loans Companies, Credit Unions, and NGOs. A Savings and Loans Company is a registered financial institution which is mandated to provide a limited range of financial services. They are supervised by the Bank of Ghana (Awunyo-Vitor et al., 2014)). Credit Unions are member-owned financial co-operatives, democratically controlled by their members and operate to promote thrift, provide credit at competitive rates and provide other financial services to their members (Awunyo-Vitor et al., 2014).

When farmers are credit-constrained, they are compelled to rely on the informal sector as a source of finance. This sector consists of moneylenders, traders, family members, friends, neighbours, and the traditional susu system. However, the amounts coming from these sources of credit tend to be inadequate for farm investments (Nkegbe, 2018). Analogous to this is the fact that a farmer's social networks may be faced with similar economic challenges as the farmer and can therefore not be relied upon sustainably. In such instances, moneylenders have been known to fill the financing gap for farmers. Moneylenders disburse collateral-free credit quickly to farmers especially when the client is known.

This study primarily focuses on the expansion of financial services offered by formal (and to some extent semi-formal) financial institutions. This emphasis is due to the significantly larger capital resources of formal institutions compared to informal ones, which are essential for meeting the demand for small-scale agricultural finance. While informal financial institutions undoubtedly play an invaluable role in providing access to finance and savings schemes in regions where formal services are lacking, their reach is inherently limited. Additionally, certain informal sources of credit, like moneylenders are not ideal sources of farm credit due to their exorbitant interest rates (usually far higher than the bank's) and the short turnaround time (Appiah-Twumasi et al., 2022).

## 3.6. Research setting

The specific case study included in this work is set in and around the city of Kumasi, near the centre of the Ashanti Region, which is located at the top of the southern part of Ghana, as seen in figure 3.2. Kumasi is the second largest city of Ghana, after the capital Accra, and is inhabited by approximately 3.3 million people. The Ashanti region, together with Greater Accra, is seen as the most urbanised and developed part of the country and holds 19.4% of the national population, of which 36.6% participate in small-scale agriculture (Abbam et al., 2018). The region has a variety of smallholders, commercial smallholders, and also farmer associations. Because of the semi-urbanised environment, infrastructure is expected to be of such quality that the farmers will be relatively easy to access. Ecologically, Kumasi falls within the semi-deciduous rainforest, referring to bimodal rainfall with an average of 1400mm per year, making it the second most-highest rainfall zone in the country (Abbam et al., 2018).

The bimodal rainfall is expressed by a dry season (typically November to March) and a wet season (typically April to October). The lack of irrigation technology limits the ability of farmers to cultivate in the dry season and causes many farmers to resort to alternative sources of employment during this time of the year (Dzanku, 2015). This also means that there is a shortage of home-grown perishable commodities like fruits and vegetables, which then have to be imported at great expense (Robinson & Kolavalli, 2010). On the contrary, during the wet season, there will be overproduction, which will lead to a lower market value for the farmers' produce and an increased level of food loss (Rutten & Verma, 2014). This emphasises the importance for farmers to properly time the sowing and harvesting of their produce in relation to the market demand to reach an optimal revenue, which is complicated further by the influence of climate change (Abbam et al., 2018).

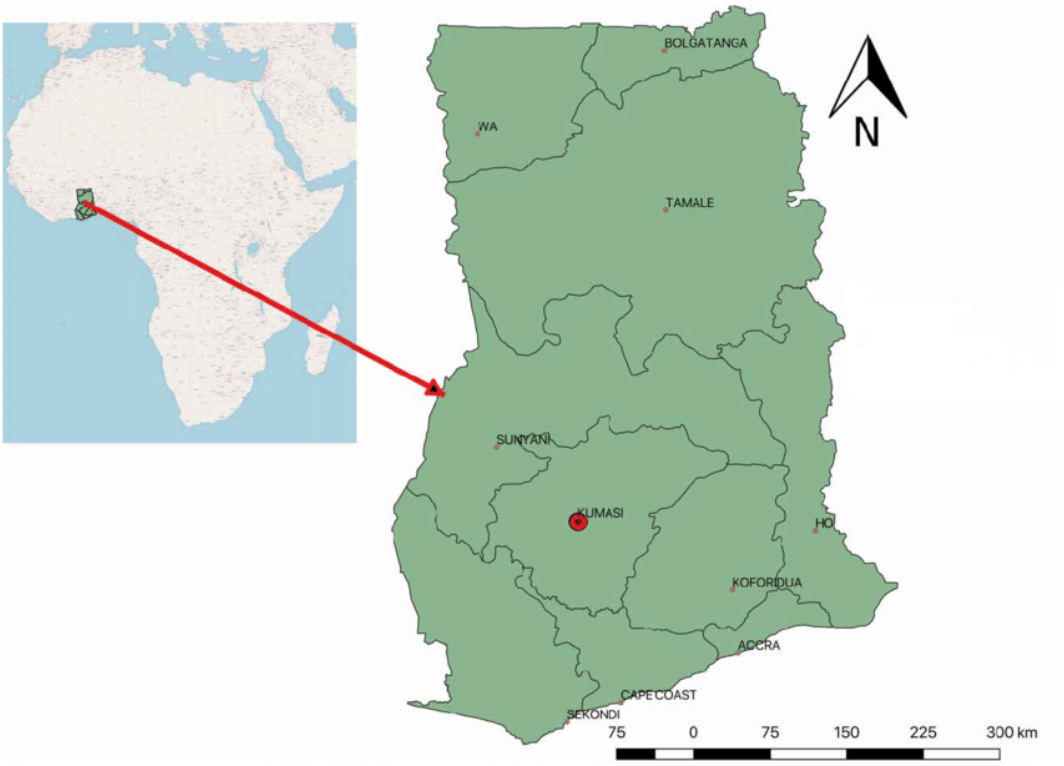


**Figure 3.2:** The geographical location of Kumasi, Ghana.

# 4

# Methodology

This chapter describes the methodology that is utilised in this study. Section 4.1 justifies the decision to use a qualitative research method by relating this to the goals of the study. Section 4.2 explains the case study design that was adopted and the research steps that have been identified to provide structure to the case. Section 4.3 discusses the considerations that were into account for the participant selection. Section 4.4 elaborates on and justifies the decision to use semi-structured interviews to collect qualitative data. Finally, section 4.5 describes the methods that were used to analyse the data.

## 4.1. Research method

The purpose of this study is to explore the factors that are relevant to the financial inclusion of small-scale horticultural farmers in the region of Kumasi, Ghana, in order to obtain an in-depth understanding of the specific challenges hindering credit access for small-scale farmers in this area and identify strategic pathways that may improve the financial inclusion of this target group.

Like other markets, credit markets can be characterised by a demand- and supply-side. To accomplish the described purpose, the research design incorporated in this study will explicitly analyse the demand for and supply of credit products for small-scale horticultural farmers by taking the perspectives of potential suppliers – local, formal financial institutions - and designated recipients – small-scale farmers - into account within the specified geographical delineation. Following the study's research questions, the envisioned goal is to evaluate the existing financial services thoroughly, particularly loan products, and identify challenges, obstacles and improvement pathways regarding small-scale agricultural credit provision.

To gain an in-depth understanding of the behaviours, rationales and interpretations of the two groups under study, a qualitative approach was adopted to gather data. In general, qualitative methods are used to gain a deeper understanding of people's perceptions regarding a particular phenomenon (Merriam, 2015), which is found to align with the purposes of this study.

## 4.2. Research design

This study adopts the research design of an exploratory case study. Yin (2014) posited three conditions for the use of a case study: the purpose must be to answer "how" or "why" questions, the investigator must have little control over events, and the focus must be on a contemporary phenomenon within a real-life context. An exploratory case study is used when there is no pre-determined outcome, and the researcher wishes to gain an extensive and in-depth description of a social phenomenon (Yin, 2014). The exploratory case study is used to explore presumed causal links that are too complex for a survey or experiment (Yin, 2014). Eisenhardt and Graebner (2007) state that building theory from cases involves using one or more cases "to create theoretical constructs, propositions, and/or midrange theory from case-based, empirical evidence" (p. 25). In an exploratory case study, a theory is built from our research.

To bring structure to the case study, three key research steps are identified. The phenomenon under study is the credit provision to horticultural commercial smallholders, with a geographical focus on the region of Kumasi, Ghana. Given that credit markets, including those for agricultural purposes, can be characterised by a demand- and supply-side, the research steps are formulated accordingly, and summarised in figure 4.1. The first step is to analyse the demand for credit, by focusing on the commercial horticultural smallholders. The second step consists of analysing the supply of credit, by investigating the formal financial institutions active within the locality. In the third step, the findings of the first two steps are compared, conformity will be checked to increase the internal validity of the results, and significant disparities will be highlighted, thus offering a comprehensive overview of the key aspects of the case. The findings will be re-organised to identify overarching challenges concerning the credit provision to small-scale farmers.

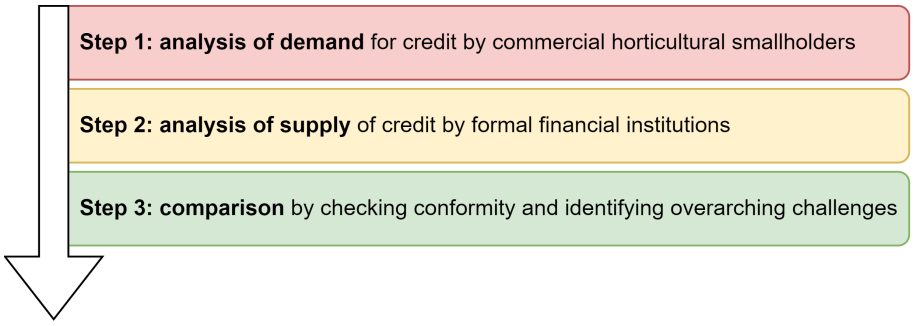


**Figure 4.1:** A visual representation of the steps that have been identified to structure the case study, own image.

In case studies, a conceptual framework is developed rather than a theoretical framework. Jabareen (2009) defined a conceptual framework as ”a network, or ”a plane”, of interlinked concepts that together provide a comprehensive understanding of a phenomenon or phenomena” (p. 51). In this case, the hierarchical model of the dimensions of financial inclusion, visualised in figure 2.1, serves as the initial framework and will be expanded using the results of the case.

## 4.3. Participant selection

As discussed in section 4.2, this study adopts a case study approach that focuses on the formal credit provision to small-scale farmers in the region of Kumasi, Ghana. Given the identified research steps within the case, participants are selected based on the demand- and supply-side of the credit market: commercial horticultural smallholders and representatives of formal financial institutions. This section elaborates on the selection of the participants in both categories.

With regards to the commercial horticultural smallholders, the participant selection was neither random nor selected to represent the overall small-scale farmer population. The selected farmers were chosen in accordance with the definition of commercial horticultural smallholders given in section 2.3, and based on the convenience of the professional network relations of HGT and KAC. The selection therefore includes some farmers who fulfil a role as ”lead farmer” within the ACHI project, which has been characterised in section 3.1. The design did explicitly include participants that differed based on membership of a FBO, and level of experience with loan products and is used to provide indicative information based on qualitative, primary data.

As for the representatives of financial institutions, the selection was neither random nor selected to represent the local formal financial sector. The research design aimed to cover a wide range of formal financial institutions in the local area, in particular commercial banks, development banks, rural banks and credit unions. The financial institutions were picked on a convenience basis with the following considerations:

- Willingness to provide information in an interview
- Anticipated relevance of the institution in providing financial services to small-scale horticultural farmers
- Logistical considerations

It was always guaranteed that the interviewed representative(s) of the financial institutions had direct experience with the credit provision of that particular institution. This meant that it was explicitly requested to conduct interviews with employees who hold functions like credit officers or branch managers.

## 4.4. Data collection

The data for this study was collected using semi-structured interviews. Qu and Dumay (2011) argue that "the semi-structured interview involves questioning guided by identified themes in a consistent and systematic manner interposed with probes to elicit more elaborate responses" (p. 246). This enables the generation of descriptions grounded in reality (Miles & Huberman, 1994). Furthermore, semi-structured interviews are especially useful when researchers try to understand the interviewees' perception of the phenomenon under study (Qu & Dumay, 2011). As this study focuses on the perception of small-scale farmers and financial institutions on credit provision, there is alignment. Interview guides served as the basis for the interviews. These guides included some probing questions that were categorised by the themes that followed from the literature review, discussed in chapter 2. The themes that were featured in the interview guides are specified further in this subsection. The interview guides were intentionally kept concise and included broad topics and questions. This approach was chosen to allow for a degree of flexibility within the interview, encouraging and stimulating interviewees to bring up topics they found to be of importance. Subsequently, it was the researcher's responsibility to delve deeper into these topics by posing additional questions for elaboration.

At the start of the interview, participants were informed about the purpose of the study, and the terms and conditions related to participation, and asked to give consent. During and after data collection, confidentiality was assured. During the interviews, audio was recorded, and the researcher made notes, which served as the basis for transcription. The interviews were conducted in the period from 2 October 2023 to 27 November 2023. In total, 11 small-scale horticultural farmers, 10 representatives of financial institutions, and 5 experts were interviewed. The expert interviews, although not directly incorporated in the cases, were used to provide additional contextual and background information, as well as external validation of the topics discussed within the cases.

The interviews with the farmers covered the following topics: farm characteristics, limitations for growth, risk exposure, and their experience with or perception of financial services. The interviews with financial institutions covered institutional characteristics, available financial services and credit products, loan assessment and monitoring procedures, risk management, and experience with or perception of credit provision to agriculture. All interviews with farmers and financial institutions were conducted at the place of work of the interviewee, being the farm or the financial institution, so that the researcher would be able to get some additional contextual information about the practices utilised in their respective workplaces.

## 4.5. Data analysis

The qualitative data that was collected from the semi-structured interviews was analysed using a context analysis technique based on guidelines stipulated by Creswell (2006). The raw data was transformed by searching, evaluating, recognizing, coding, mapping, exploring, and describing patterns and trends. Ultimately, themes and categories in the raw data were carried out to interpret and extract their underlying meanings through a thematic data analysis process (Braun & Clarke, 2006; Williamson et al., 2018).

ATLAS.ti was used to analyse and index data into relevant themes, as outlined by Soratto et al. (2020). This approach, adjusted for this particular study can be found in table 4.1. These steps were completed for both cases separately, after which cross-case analysis was performed to compare the codes and integrate insights from both steps.

**Table 4.1:** Adjusted thematic content analysis steps in ATLAS.ti.

| | **Phase of thematic content analysis** | **Steps in ATLAS.ti** |
|---|---|---|
| 1. | Pre-analysis | Creating the project<br>Adding the interview transcripts |
| 2. | Material exploration | Reading transcripts<br>Creating and applying codes<br>Writing memos and comments<br>Exploring the coded data using various analysis tools |
| 3. | Interpretation | Identifying relevant codes<br>Generating network views<br>Summarising key insights from relevant codes<br>Integrating codes and insights within framework |

# 5

# Results

This chapter provides an overview of the results of the case study, which utilised the three research steps outlined in chapter 4, and summarised in figure 4.1. The results of the case build upon the hierarchical model of the dimensions of financial inclusion, discussed in section 2.1, and visualised in figure 2.1. It does so by specifying each dimension with relevant themes, codes and insights that emerged from the interview analyses of the case.

The following structure is used: first, in section 5.1, an overview is given of the small-scale farmers that were interviewed and the dimensions of financial inclusion - access, usage and quality - are specified with insights and codes obtained from these interviews. Second, in section 5.2, an overview is given of the representatives of financial institutions that were interviewed and the dimensions of financial inclusion are specified with insights and codes obtained from these interviews. This structure is visualised in figure 5.1. Finally, section 5.3 compares the results of sections 5.1 and 5.2, and re-organises them to identify overarching challenges.

## 5.1. Analysis of demand

For this step, semi-structured interviews with 10 horticultural farmers were conducted and analysed to collect indicative information about the farmers' characteristics, their exposure to risks, obstacles to growth and their experience with or perception of financial services, with a particular focus on loans. The interview codes, as well as the given approximations for plot sizes, land ownership, membership of Farmer-Based Organization (FBO) and the horticultural crops typically cultivated by the farmer, depending on preference or season, are summarised in table 5.1.

The codes and insights that emerged during the analysis of the interviews with small-scale farmers and were found to be relevant with regard to financial inclusion are categorised under their associated dimension, as supplied by the hierarchical model of the dimensions of financial inclusion, visualised in 2.1. All codes and insights are briefly discussed with illustrative quotes from the interviews.

### 5.1.1. Access

The insights and corresponding codes that emerged from the interviews with the small-scale farmers that have been found to correspond to the access dimension are discussed. Consequently, they are placed under the associated themes supplied by the literature review, discussed in section 2.1.

#### Interest rates & securities

Farmers state that the agricultural loan facilities offered have high interest rates, often in the order of 30% or more. To become eligible, financial institutions primarily rely on an individual's ability to comply with security requirements like group form loans or collaterals. Farmers emphasise an aversion towards joint-liability schemes and difficulties supplying traditional collaterals.

> "To expand the farm, I mostly used the money I earned with the farm. Interest rates were very high at the branch and most banks were not willing to give loans to farmers. Some

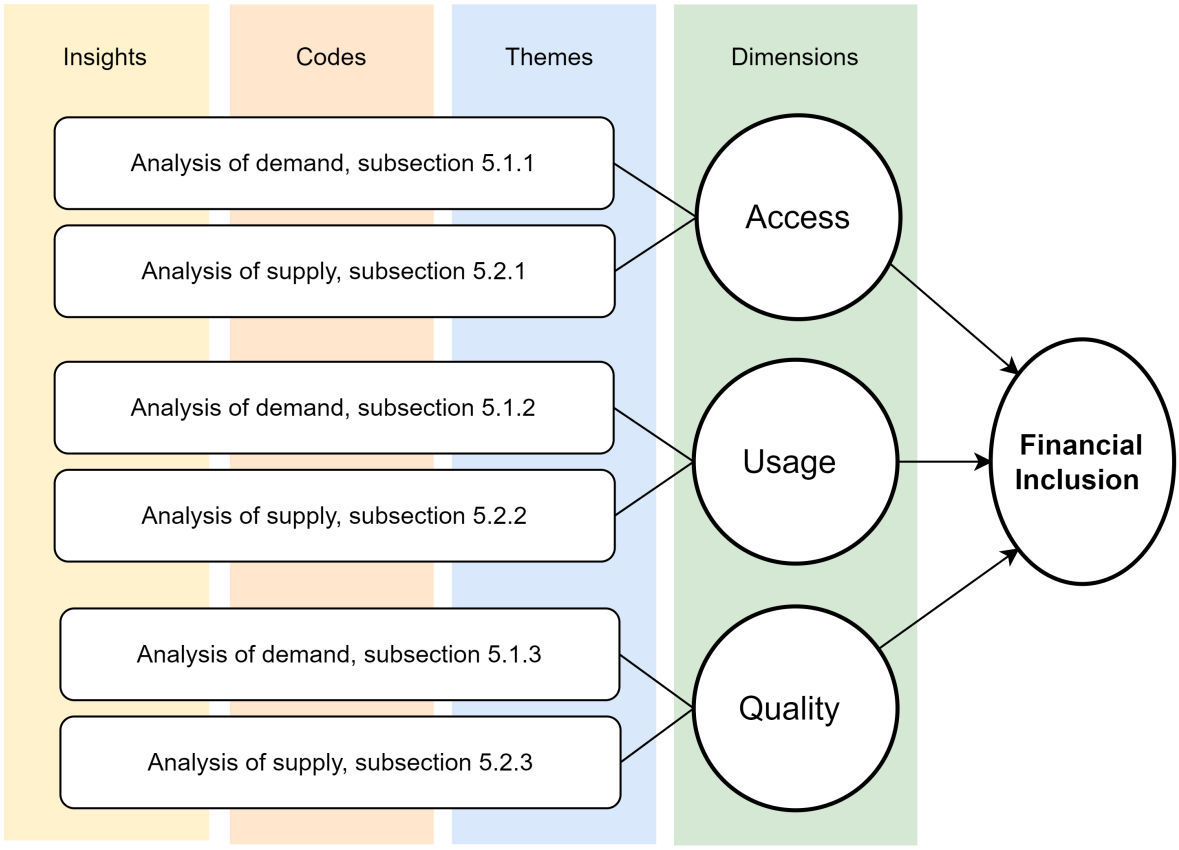


**Figure 5.1:** Overview of the structure of sections 5.1 and 5.2, own image.

**Table 5.1:** Overview of interviewed farmers: interviews codes, approximations for plot sizes, land ownership, membership of Farmer-Based Organization (FBO) and horticultural crops typically under cultivation.

| Interview code | Plot size (ha) | Land ownership | Member of FBO | Horticultural crops |
|---|---|---|---|---|
| F1 | 2 | Owned by famer | No | Tomato |
| F2 | 2,4 | - | No | Chilli pepper |
| F3 | 4 | Rented from government | No | Cabbage, cauliflower, watermelon, cucumber, and spring onion |
| F4 | 1,2 | Rented from family | No | Bell pepper, habanero pepper, cabbage, and tomatoes |
| F5 | 3 | Owned by famer | Yes | - |
| F6 | 1,2 | Owned by famer | Yes | Cucumber, cabbage, lettuce, spring onion, and beetroot |
| F7 | 0,6 | Owned by farmer, from family heritage | Yes | Green pepper, lettuce, cabbage, spring onion, bell pepper and cucumber |
| F8 | 2 | - | Yes | Spring onion, lettuce, cabbage, and cucumber |
| F9 | 2 | Temporarily occupied for free | Yes | Spring onion, cabbage and green peppers |
| F10 | 0,6 | - | - | Spring onion, lettuce, bay leaves, peppers and cabbage |

of them did, but they required farmers to come in groups and sometimes, when you go in groups, one can default payment, and it will affect you. I was not interested in that." (F8)

### Required income

In their selection procedures, financial institutions often require long credit histories in order to become eligible for a loan. Farmers have a low, erratic, seasonal income and often don't use savings accounts, which limits their ability to comply with this criterion.

> "For the bank system normally, before you can get a loan from the bank, you still have to do transactions with them for some time. They have to see huge sums of money before they trust in you. For me, I'm trying to start a small farming business, it's like they virtually just don't want to give loans to farmers." (F5)

### Risk perception - sector

Amongst others, small-scale horticultural farmers suffer from some substantial covariant risks. In particular, lack of technology creates a large weather dependency, resulting in risks associated with its unpredictability, e.g. crop flooding or dehydration. Furthermore, farmers face price risks when selling their produce. In almost all cases, farmers sell their produce either at local markets, through so-called "market women" or to aggregators. In both scenarios, pricing is not regulated and thereby heavily dependent on the judgement of the buyer. This judgement is primarly based on supply-and-demand dynamics and the quality of the produce. Lack of cooled storage systems and poor infrastructure, combined with the perishable nature of fruits and vegetables, weakens the bargaining position of the farmers, exacerbating these price-related risks. These factors contribute to a perception of high risk concerning small-scale farmers, complicating their eligibility with regard to credit products.

> "The price is normally determined by the time. When you plant at the right time, and you don't meet the market, the price will be different. That's how it is. When you are going in the dry season, the work can be difficult, you have to irrigate. When it is raining season and the rain is falling, it is cheap for everybody to plant. So that time you won't get the price that you want, it will come down." (F9)

> "Main risk of the farming business is the rain. I am only doing rainfed, so if it rains a lot, It can flood the farm. To mitigate this, I try to raise the beds on which the crops are planted to protect them. However, 2 months ago, the rain was so bad, my whole plot got destroyed." (F5)

> "The women determine the market and the price. This is a general problem for all the farmers. Because the women have one mouth piece. And the farmer's don't. That's why they are always able to beat us. The market women are more organised. The farmer groups can decide on something that they will do but somebody will pass you back, and go and do something else. If the women say something than everybody will agree. So they have the bargaining power." (F10)

### Farmer-Based Organization

The farmers who were members of an FBO highlighted the advantages it gave them. In general, FBOs gave farmers a platform to share knowledge surrounding agricultural practices and the ability to implement standardised practices. Furthermore, it was also emphasised that farmers in an organisation are more recognised, and the reputation of an organisation can enable farmers who are members to become eligible for a loan.

> "The benefit of the association: we are identified within the municipality and by the agric[ultural] directors, so whenever new information comes out, they channel it to us. Also, they give us workshops to upgrade our knowledge. Within the association, we meet once a month, to exchange ideas. We use one farmer's residence for that. We share problems and seek knowledge from elsewhere like extension officers." (F8)

> "The loan was not as hard to get because they recognised the association. It has a reputation. The government has named the association in parliament. The bank also comes to the field. No need for audited accounts and collateral. They only wanted to be assured that

the production and the records were okay. They check that but after that, they don't ask any questions again. They believe in the association." (F6)

### Framework

The insights and codes discussed in this section are categorised under the relevant themes that have been selected from the literature review, presented in section 2.1, within the access dimension. First, the insight related to "Interest rates" has been found to directly correspond with the affordability of a financial product. Second, the insights related to "Securities", "Required income", "risk perception - sector", and "Farmer-Based Organization" are found to directly influence the eligibility of farmers when it comes to loan qualification. Figure 5.2 summarises the insights gained from the codes, and categorises them according under the relevant themes within the access dimension.

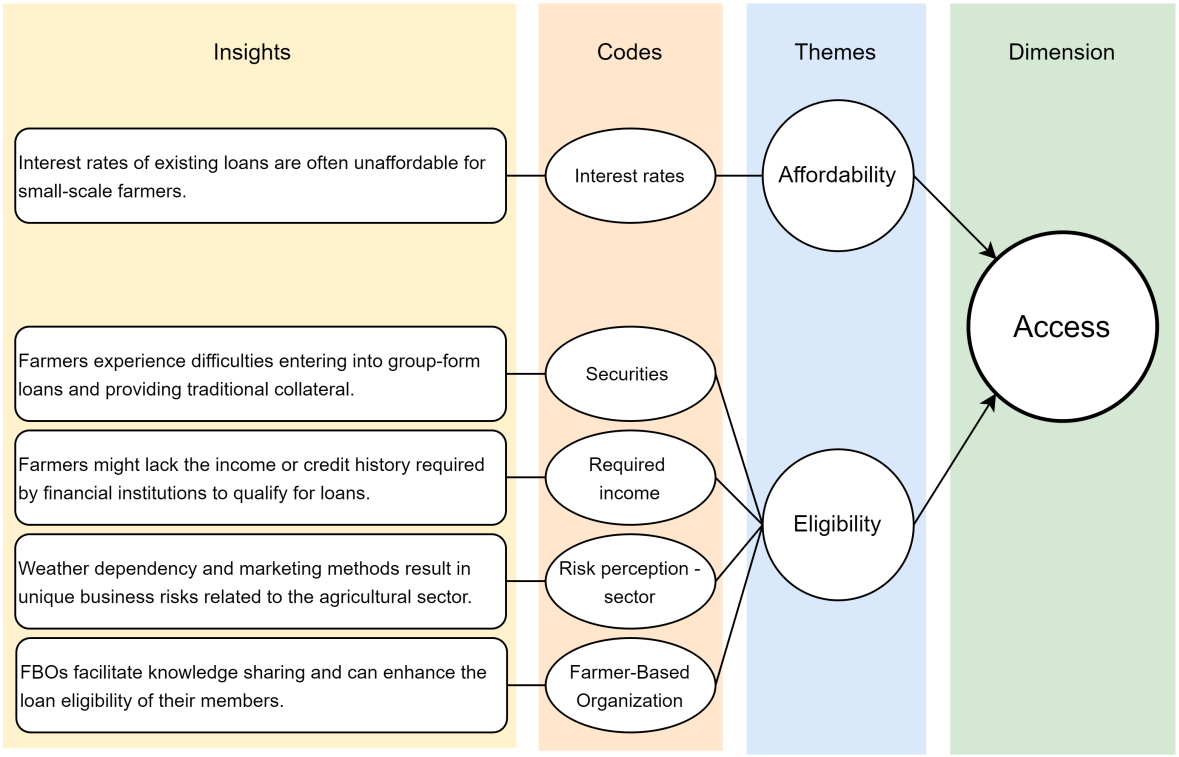


**Figure 5.2:** Categorization of insights and codes that emerged from analysis of demand under the relevant themes within the access dimension, own image.

## 5.1.2. Usage

The insights and corresponding codes that emerged from the interviews with the small-scale farmers that have been found to correspond to the usage dimension are discussed. Consequently, they are placed under the associated themes supplied by the literature review, discussed in section 2.1.

### Lack of finance

Farmers confirm that a lack of financial resources is a major limitation for business growth, and state that loans would enable them to adopt improved agricultural technologies, like irrigation, allowing them to farm in the dry season, hire labour forces, and afford quality inputs.

> "The loan is the first I got, I needed the money to expand and to employ more works, especially the youth to come into the agric[ultual] sector. There is money in this sector and many of the youth are unemployed. This is such a good opportunity for them. I want to train them and to let them know that there is work here in the agric[ultual] sector. I use to the loan to pay their salaries and buy inputs." " (F6)

### Risk aversion

Some farmers are reluctant to take on loan facilities because they are risk-averse and afraid of the possibility they might not be able to repay. They often choose to reinvest their profits.

> "Maybe at times the interest was too high and I couldn't afford it. Others did go for it and they couldn't pay. If you know that you can work and take your profit and invest it then maybe it is better for you. You are secure and you have peace of mind because you know that it is your own capital." (F9)

Some farmers acknowledge the risks their farm is exposed to and identify this as a reason to refrain from loan use.

> "I have never gone for any loan before. Because of the risks involved with farming, I am very scared when it comes to a loan. If I go for a loan and it does not work out, I do not have any place to go and get money to pay the loan. This is why I am cautious when it comes to loan acquisition." (F3)

### Financial literacy & record keeping

In terms of record keeping, most farmers kept no business records, stating they would do the administration "in their head". Others indicated that they kept a few general recordings of farming expenses, profits and sales. There was one farmer who kept records of his expenses and revenue per planted bed and per crop and translated this to monthly earnings and expenses. Only some farmers used a savings account.

### Framework

The insights and codes discussed in this section are categorised under the relevant themes that have been selected from the literature review, presented in section 2.1, within the usage dimension. First, the insight under "Lack of finance" has been found to directly correspond with the need for credit by farmers. Second, the insight under "Risk aversion" has been found to contribute to the voluntary exclusion of farmers. Third, "Financial literacy" and "Record keeping" relate to the capability of farmers to be able to use financial products. Figure 5.3 summarises the insights gained from the codes, and categorises them according under the relevant themes within the usage dimension.

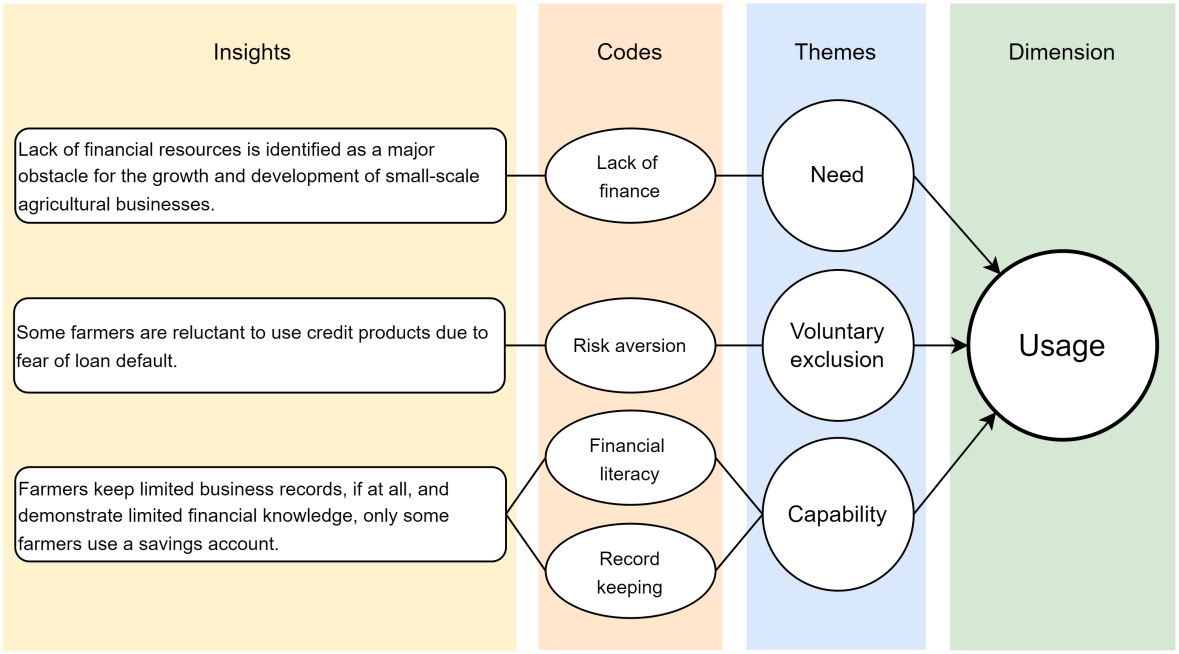


**Figure 5.3:** Categorization of insights and codes that emerged from analysis of demand under the relevant themes within the usage dimension, own image.

### 5.1.3. Quality

The insights and corresponding code that emerged from the interviews with the small-scale farmers that have been found to correspond to the quality dimension are discussed. Consequently, they are placed under the associated themes supplied by the literature review, discussed in section 2.1.

#### Tailored products

Farmers emphasise a need for credit products that feature longer durations and repayment periods, aligning with their seasonal income structure. Some farmers had experience with more traditional loans and emphasised the difficulties they endured to be able to comply with these repayment conditions.

> "We hope for loans that have a long duration and repayment period. I think then, many of us will go and do it. But now, these banks, they give you a loan, the best will be 3 months and they will be asking for money. Also, with a duration of 3 months, the grace period will be only 6 weeks. If you have a crop failure then it will be difficult to repay." (F8)

> "In the past, I had a soft loan, which was very stressful to pay back. Therefore I decided to look for other sources of income. The payback started only one month after disbursement. This did not suit my needs." (F1)

#### Framework

The insight and code discussed in this section are categorised under the relevant theme that has been selected from the literature review, presented in section 2.1, within the quality dimension. "Tailored products" has been found to be directly associated with the suitability of financial products. Figure 5.4 summarises the insight gained from this code, and categorises it under the relevant theme within the quality dimension.

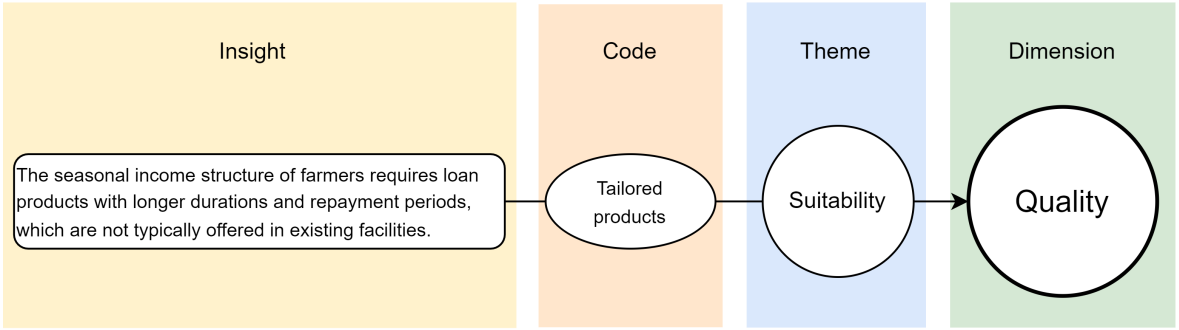


**Figure 5.4:** Categorization of insights and codes that emerged from analysis of demand under the relevant themes within the quality dimension, own image.

## 5.2. Analysis of supply

For this step, semi-structured interviews with representatives of 11 financial institutions in and surrounding Kumasi were conducted and analysed to obtain indicative information about their characteristics, product offerings, loan selection and monitoring procedures, risk management, and experience with or perception of providing credit to small-scale farmers. Table 5.2 gives an overview of the interview codes, the type of institution, the respective area of operations and role of the interviewee(s) within the institution.

The codes and insights that emerged during the analysis of interviews with representatives of financial institutions and were found to be relevant with regard to financial inclusion are categorised under their associated dimension, as supplied by the hierarchical model of the dimensions of financial inclusion, visualised in 2.1. All codes and insights are briefly discussed with illustrative quotes from the interviews.

### 5.2.1. Access

The insights and corresponding codes that emerged from the interviews with the representatives of financial institutions that have been found to correspond to the access dimension are discussed. Consequently, they are placed under the associated themes supplied by the literature review, discussed in section 2.1.

**Table 5.2:** Overview of interviewed financial institutions: interview codes, institution types, areas of operation and functions of the interviewee(s)

| Interview code | Institution Type | Area of operations | Interviewee(s) function(s) |
|---|---|---|---|
| FI1 | Commercial bank | Ghana – international | Credit officer |
| FI2 | Development bank | Ghana | Corporate Credit Risk officer |
| FI3 | Rural bank | Ashanti region | Branche manager & MFI officer |
| FI4 | Rural bank | Ashanti region | Credit officer |
| FI5 | Rural bank | Ashanti region | Branche manager |
| FI6 | Commercial bank | Ghana | Credit officer |
| FI7 | Rural bank | Ashanti region | Credit officer |
| FI8 | Rural bank | Ashanti region | 2 Credit officers |
| FI9 | Credit union | Kumasi area | Manager |
| FI10 | Rural bank | Ashanti region | Branche manager |
| FI11 | Credit union | Kumasi area | Manager |

### Interest rates

Financial institutions use high interest rates that result from the high interest rates on treasury bills and serve as compensation for the perception of high risk associated with small-scale agricultural businesses. Financial institutions do recognize that this negatively the affordability of their credit products.

> "Credit products are priced high. The bank is paying high for deposits. Treasury bills are now 30 something percent. For the interest rate of the loan you have to be above that. But this is very high for a small-scale farmer. A bank for prudency sake will want a price that gives a good return. That makes it difficult." (FI2)

> "Business loans have the highest interest rate because that is where the risk is. For agric[ulture] it would be 32% to compensate for the risk." (FI10)

### Securities

Financial institutions explain the challenges farmers face when providing the necessary securities to qualify for loans. While they acknowledge that they utilise strict collateral requirements, they point to problems relating to farmers suffering from weak land ownership documentation, low rural property values, and the difficulties farmers have to go through to find groups to apply for joint liability loans.

> "The land ownership system is also a challenge. If you are coming for a loan, you have to provide a security. If you want to use land, they would say that the land is family property and not entitled in their name. "The chief has given us the land." They don't have any documentation or papers that say it is in their name. We need those papers to be able to get the land when they fail to repay." (FI6)

> "Groups won't accept you because of this. Some farmers do apply, but most farmers already know I will not give it. Let's take cabbage. It will take 40 days to harvest. Our grace period is 3 weeks. How are you going to get money for the first repayment? All those things take longer, until harvest, before you make money." (FI7)

> "Most of the farms are countryside projects. We accept houses or buildings as collateral. The problem is that the land values in villages are low compared to cities. The collateral regime for the banking sector is tight. Generally, lending is done based on it, and not on cash flows. Smallholders are unable to get this. Because the level of uncertainty of the primary [income] source is high, then you want to mitigate with a second source to cover your investment." (FI2)

### Risk perception - sector

Financial institutions are reluctant to give out loans to farmers because of the perception of high risk they have of small-scale businesses in the agricultural sector, resulting in limited credit provision.

> "The reason we don't like giving out loans to farmers, those who solely farm, is the weather in Ghana. We don't use machineries, we depend solely on the weather. The weather can

> fail you. When you are waiting for the rain and the rain doesn't come, then all the capital is lost. We don't give loans to farmers, seriously, because the probability that a person will not be able to pay is high." (FI7)

> "So in terms of production there may be no problem, but marketing is a huge problem. Nationwide. it is not standardised. This is what goes against the crop sites. You won't be able to judge what your revenue is going to be, you won't be able to determine how viable your project is. (…) The human intervention is too much in terms of the valuation of prices. It is not standardised, we don't even use weight. It is difficult for a bank to make an assessment, especially when they come without records." (FI2)

#### Risk perception - funds diversion

Financial institutions highlight major issues concerning a risk they refer to as a diversion of funds. This risk materialises when a customer does not use the provided credit for the purpose that was agreed upon with the financial institution. Often, the agreed purpose of the loan is a business improvement or expansion. The loan can be disbursed because the recipient is reasonably expected to get a return on this investment, with which he can repay the loan. This purpose is investigated during the loan selection procedures. When the loan recipient diverts these funds to other purposes that are not checked by the financial institution, the probability of repayment will decrease rapidly. Ultimately, in the majority of cases, this will be the cause of loan default. The expected business improvement on which the loan provision was based, will not occur, and the recipient will face extreme difficulties repaying the loan.

> "Those who invest their loan in the business generally do not default. This is my experience, so this is what we have to be sure about. They use the entire loan to pay for school fees or rent. There is obviously no return from that. They will repay for 1, 2, 3 months and then we see diminishing in their shop. This signals to us that the person did not invest it in the business. We take caution then." (FI7)

> "To stop people from using loans for other purposes, this is a big problem. They will even come for a loan to pay off another. Sometimes what we do is just to delay them, and look at their reactions. The customers who are pressing us more are generally less trusted. Maybe we know someone around the area of the customer that we can call to check if they know if other banks are also coming around. Ghanaians are pretty genuine, if they see something they will tell us. People misusing the money is the biggest risk." (FI7)

#### Risk perception - trust

Because the risk of diversion of funds is not preferred by banks, some customers will tend to lie about the intended purpose of a loan during the selection phase. This can cause significant credibility issues which results in cautious behaviour by financial institutions. Financial institutions have to go a long way to ascertain the credibility of loan recipients, to make sure they are honest about their intentions and to prevent recipients from running away with the money.

> "People often are not truthful. Even after this [application] process people are still dishonest. We need honest people so that they will also be honest with the loan repayment. If any information turns out to be wrong, the process is over of course." (FI4)

> "Some even come to collect loans to sponsor their children abroad, schools etc. In the assessment, it would take too much for us to uncover such a hidden agenda. For the person, he or she knows, but they just cover it. They do all the necessary research and then divert [the money] to different things." (FI6)

#### Framework

The insights and codes discussed in this section are categorised under the relevant themes that have been selected from the literature review, presented in section 2.1, within the access dimension. First, the insight under "Interest rate" has been found to relate to the affordability of loan products. Second, the codes "Securities", "Risk perception - sector", "Risk perception - diversion" and "Risk perception - trust" have been found to influence the eligibility requirements of loan products. Figure 5.5 summarises the insights gained from the codes, and categorises them according under the relevant themes within the access dimension.

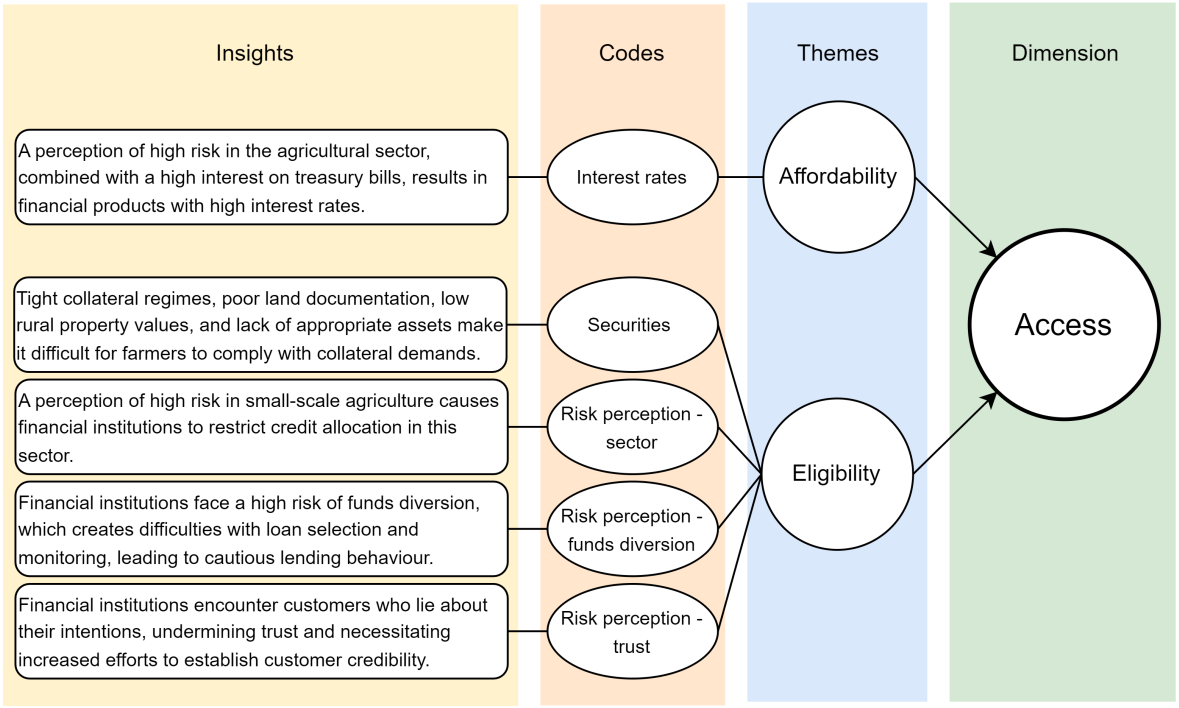


**Figure 5.5:** Categorization of insights and codes that emerged from analysis of supply under the relevant themes within the access dimension, own image.

### 5.2.2. Usage

The insights and corresponding codes that emerged from the interviews with the representatives of financial institutions that have been found to correspond to the usage dimension are discussed. Consequently, they are placed under the associated themes supplied by the literature review, discussed in section 2.1.

#### Psychological objections

Some representatives of financial institutions highlight the fear people may have to acquire loans, due to the fierce measures banks may take to get their repayment.

> "There are a lot of banks that, when you take their loan, will harass you and torment you day and night. This is sometimes the reality of Africa. When you are not radical with repayment measures, you can experience difficulty getting your loan back. Some institutions have this reputation." (F11)

#### Agricultural expertise

The financial institutions that were interviewed were found to have limited knowledge about the possibilities of financing small-scale horticultural businesses. Moreover, they did not have departments or functions directly related to the agricultural sector. One officer outlined that knowledge of agriculture is often very centralised, and thus minimal at the branch level.

> "Also expertise. When you came in, they were sending you to a different place for information. Why? This is called the (...), but in terms of expertise, it is very centralised. The quality of human resources is generally low, a lot of employees simply don't know a lot about agriculture." (FI2)

Another financial institution also emphasised the need to have knowledge about agricultural methods when assessing the creditworthiness of farmers.

> "When we are dealing with farmers, you have to know about some agricultural aspects. When a customer like that comes in, it is for us to do the background check and to get yourself informed. If you have experience with that customer before, it can also give you

additional information, about how their line of cultivation is. If they are performing well." (FI8)

#### Poor record-keeping and financial literacy

Financial institutions attribute limited credit provision of farmers to weak or non-existent business records, creating difficulties when appraising businesses. This is often caused by limited financial literacy, resulting from a lack of education.

> "Book keeping is not happening due to lack of education. Information should go around. Ghana banking communities have to go to the communities and educate people on the opportunities. How do you bank, how do you save. They don't know. They ask for a facility, they don't get it, then they'll leave us. Then, they get mad at the government. That has been a problem." (FI5)

> "Farmers need an education. That is why they fail. They don't record anything. First step is education, educate them how to go and farm good. Then the first time, we don't go for a huge loan amount, because they don't have any experience. If it goes well, we will increase it step by step." (F10)

#### Framework

The insights and codes discussed in this section are categorised under the relevant themes that have been selected from the literature review, presented in section 2.1, within the usage dimension. First, "Psychological objections" is identified to be a cause of voluntary exclusion. Second, the insights under "Agricultural expertise", "Financial literacy" and "Record keeping" are found to be related to capability. Figure 5.6 summarises the insights gained from the codes, and categorises them under the relevant themes within the usage dimension.

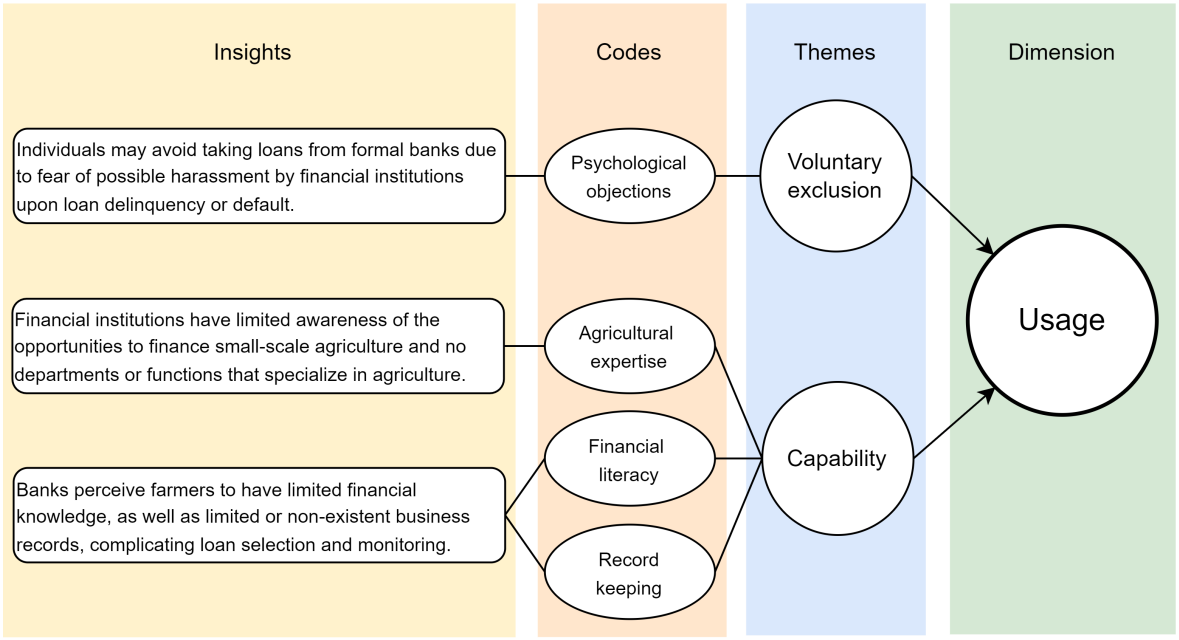


**Figure 5.6:** Categorization of insights and codes that emerged from analysis of supply under the relevant themes within the usage dimension, own image.

### 5.2.3. Quality

The insight and code that emerged from the interviews with the representatives of financial institutions that have been found to correspond to the quality dimension are discussed. Consequently, they are placed under the associated theme supplied by the literature review, discussed in section 2.1.

#### Tailored products

Financial institutions elaborate on the high risk they associate with the longer repayment periods and durations that are preferred by farmers.

> "The money, where it goes, it needs to come back. You want to invest where you can check daily if the money is coming back. The seasonality of agriculture causes durations of months before you can get anything back." (FI3)

> "Farmers normally apply but we don't have a specific product designed for the farmer businesses. (…) Because of the risky nature of their business. It is a periodic sales structure. The only income is during the harvest period. In between loan disbursement and the period where they would be able to repay is not just a month, it is way longer. So the risk involved is why we have not taken the opportunity to design such a product or criteria, though I hope in some days we can do that." (FI6)

#### Framework

The insight and code discussed in this section are categorised under the relevant theme that has been selected from the literature review, presented in section 2.1, within the quality dimension. "Tailored products" is found to be directly associated with the suitability of financial products. Figure 5.7 summarises the insight gained from this code, and categorises it under to the relevant theme within the quality dimension.

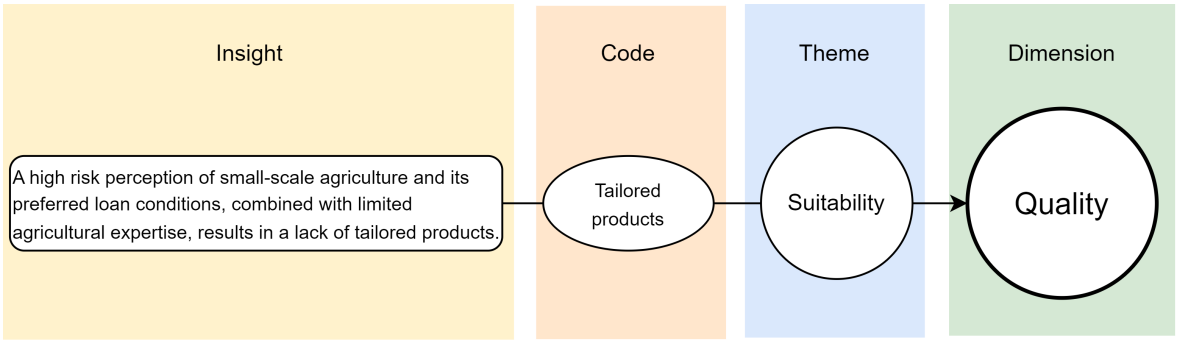


**Figure 5.7:** Categorization of insights and codes that emerged from analysis of supply under the relevant themes within the quality dimension, own image.

## 5.3. Comparison

The goal of this section is to provide internal validity by comparing all the dimensions, themes, codes and insights that emerged in sections 5.1 and 5.2 and checking conformity. Consequently, the codes are re-organised so overarching challenges can be identified.

First, it can be easily observed from sections 5.1 and 5.2 that the influence of all causal dimensions of financial inclusion - access, usage and quality - was confirmed by both the analysis of demand and supply. The next sections offer a comparison of the themes and codes that emerged in research steps relating to the analyses of demand and supply.

### 5.3.1. Theme comparison

The themes that are found to be relevant for financial inclusion in sections 5.1 and 5.2 have been compared. Figure 5.8 has visualised which themes only emerged during step 1: analysis of demand, which ones emerged in both steps, and which ones only emerged in step 2: analysis of supply and categorised them by related dimension. From this figure, it can be observed that the theme "Need" is the only theme that emerged in only one step, specifically step 1: analysis of demand.

### 5.3.2. Code comparison

To begin the code comparison, figure 5.9 provides an overview of all the codes that have been identified in sections 5.1 and 5.2, and orders them based on the research step in which they emerged, and the dimension under which they have been categorised.

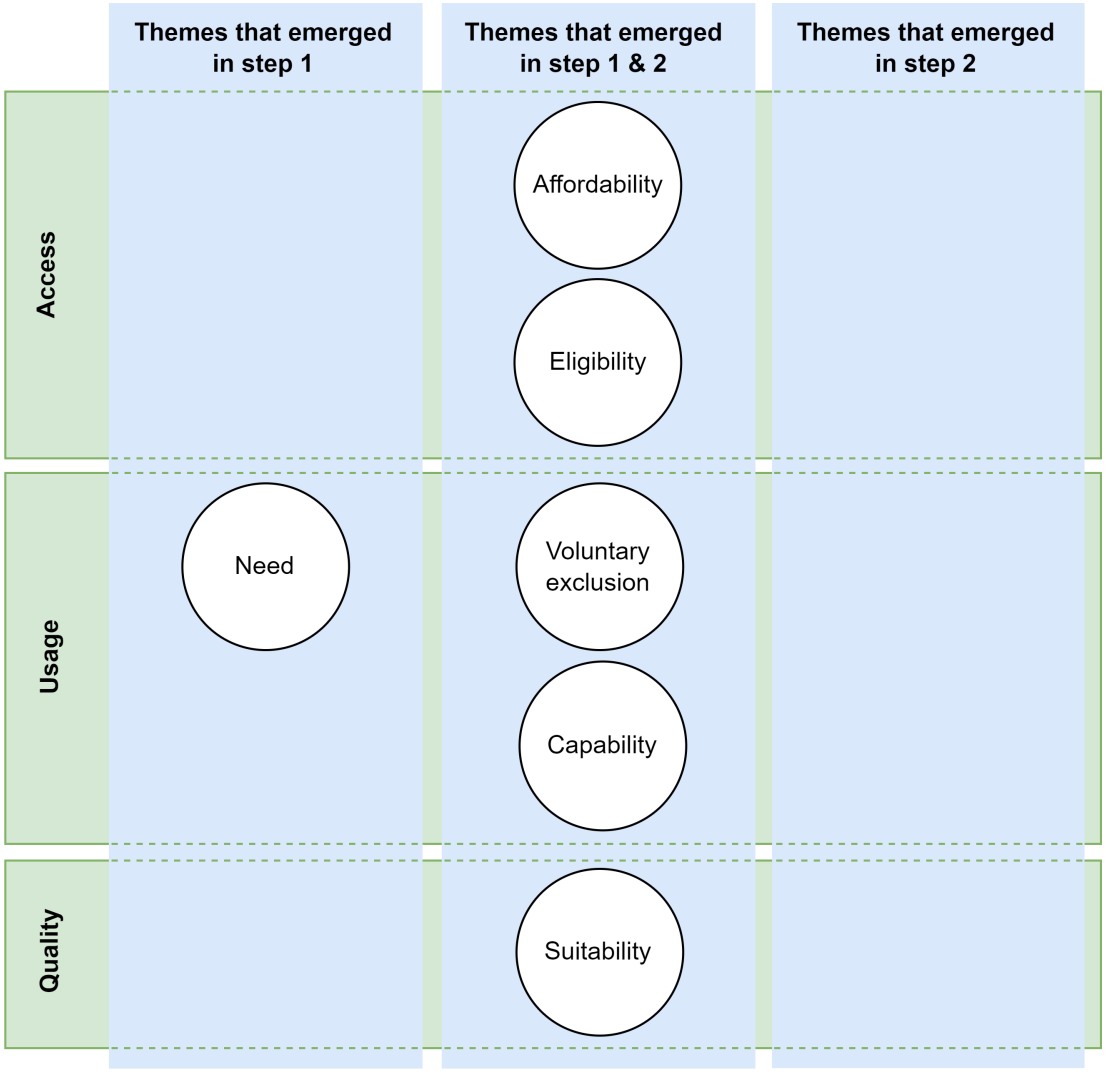


**Figure 5.8:** Overview of all themes that were found to be relevant during interview analysis, ordered by the research step in which they emerged and dimension under which they are categorised, own image.

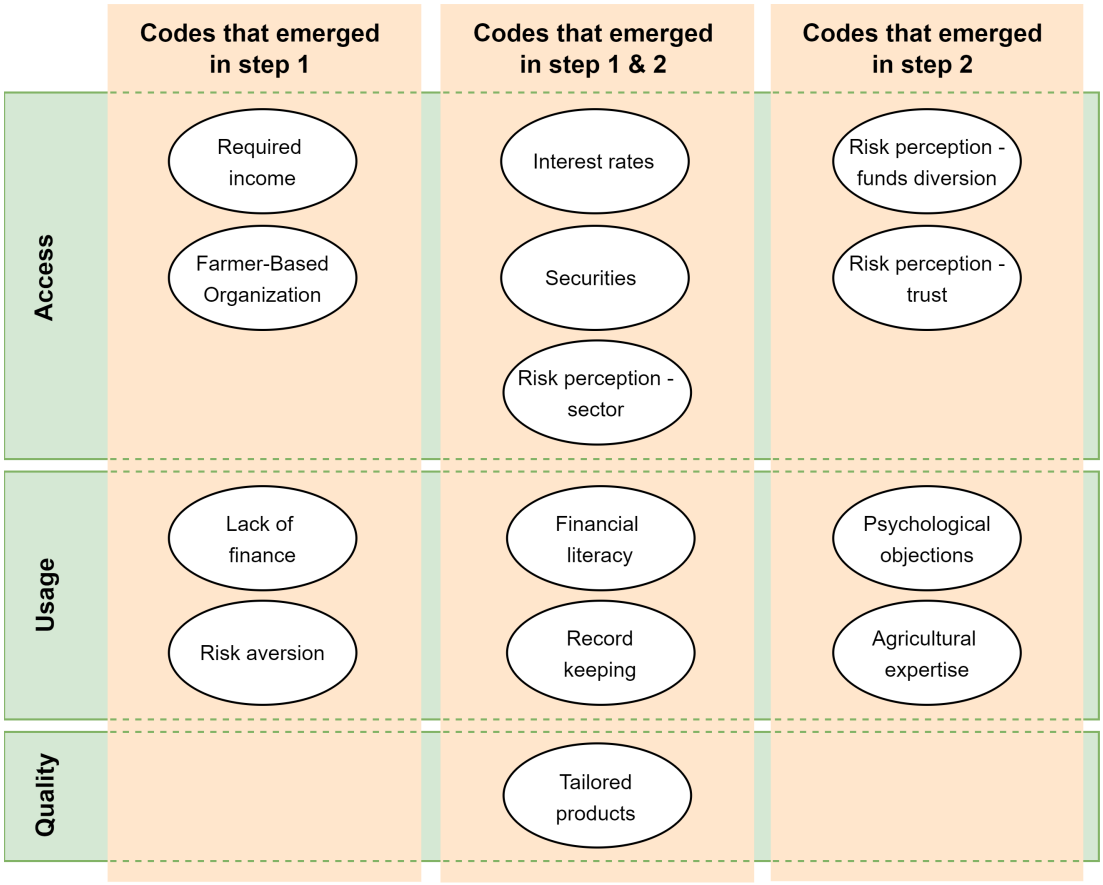


**Figure 5.9:** Overview of all codes that emerged during interview analysis, ordered by the research step in which they emerged and dimension under which they are categorised, own image.

From figure 5.9 it can be observed that the codes ”Required income”, ”Farmer-Based Organization”, ”Lack of finance”, and ”Risk aversion” only emerged during the analysis of the interviews with small-scale farmers. Furthermore, the codes ”Risk perception - funds diversion”, ”Risk perception - trust”, ”Psychological objections” and ”Agricultural expertise” only emerged during the analysis of the interviews with the representatives of financial institutions. Finally, the codes ”Interest rates”, ”Securities”, ”Risk-perception - sector”, ”Financial literacy”, ”Record keeping”, and ”Tailored products” emerged from the analyses of the interviews with both target groups.

When the insights under the codes are compared, which have been discussed in sections 5.1 and 5.2, it can be observed that there are no instances where the statements of the target groups collide. It is noted that the insights obtained from the interviews with financial institutions have a more explanatory nature.

### 5.3.3. Re-organization of codes

In this section, the codes that emerged during interview analysis are re-organised so overarching challenges can be identified. The resulting categorisation and related overarching challenges are visualised in figure 5.10.

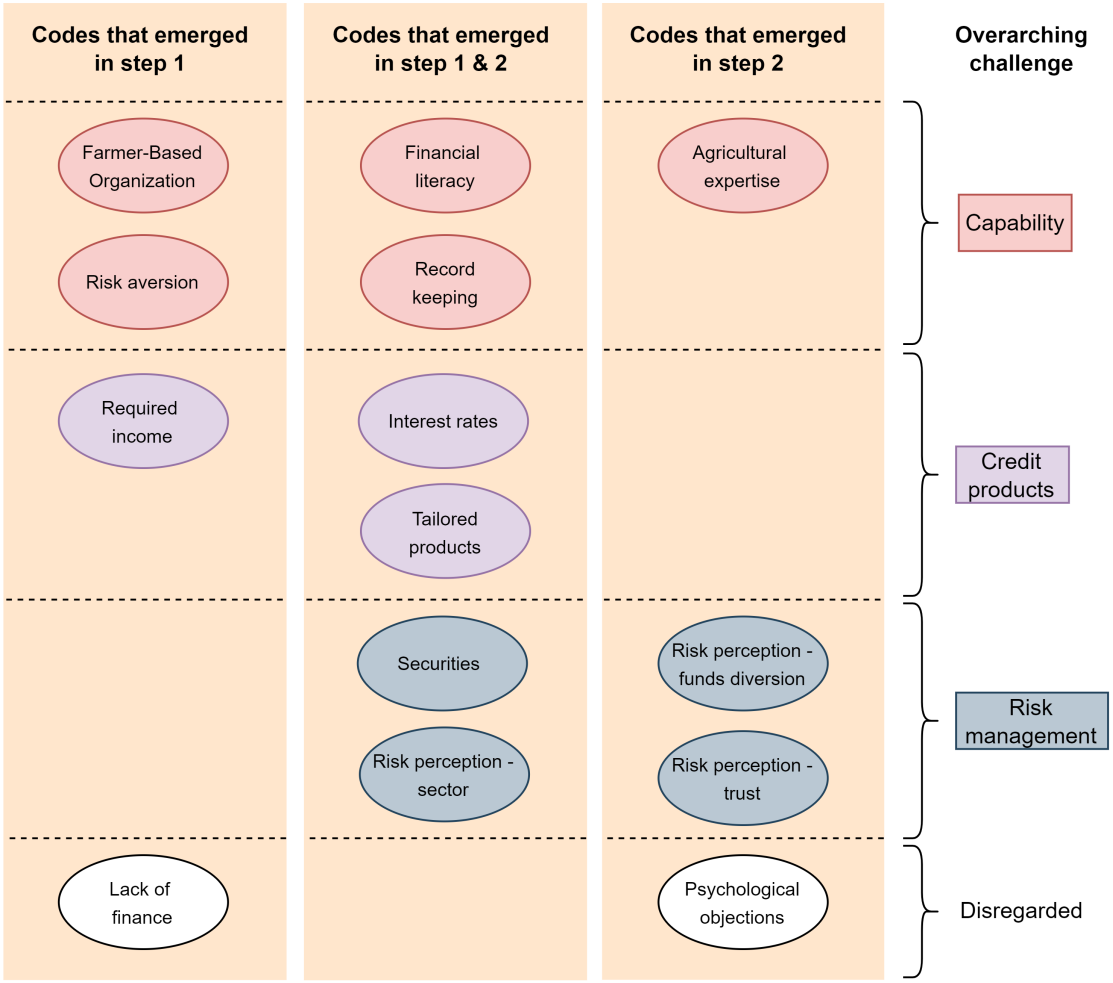


**Figure 5.10:** Re-organisation of all codes that emerged during interview analysis so over-arching challenges can be identified, own image.

The categorisation is based on the following reasoning. First, two codes were disregarded from the categorisation. Specifically, ”Lack of finance” covers the need of small-scale farmers for credit products so they can grow and improve their businesses. This code describes the fundamental problem this research aims to address. Thus, while it is crucial to confirm it with data collection and analyses, which has been done, it is not seen as particularly relevant for any further challenges that need to be

addressed. Second, the code ”Psychological objections” covers the insight that some farmers object to credit use due to fear of possible harassment from financial institutions. While this concerns a very serious issue that requires proper addressing, it is observed that the severity and character of this factor are very hard to determine based on the limited data this study has gathered on this subtopic. It is therefore neglected in the re-categorisation.

### Capability

First, the insights corresponding to the codes ”Farmer-Based Organization”, ”Risk Aversion”, ”Financial literacy”, ”Record keeping”, and ”Agricultural expertise” are found to all relate to the overarching challenge of ”Capability”. In particular, the capability of the farmer, relating to their limited financial literacy and ability to keep records, can potentially be improved by being a member of an FBO, and can result in risk aversion. Risk aversion covers the insight that some farmers voluntarily exclude themselves from using credit products because they fear loan default. As concluded from figure 2.2, which outlines the difference between access and usage, this fear can originate from character or culture, in which case it is hard to address with policy. However, in many cases, this fear stems from a lack of financial knowledge or education, which can be addressed by policy. Because of this, the code is ordered under this overarching challenge. Finally, ”Agricultural expertise”, or lack thereof, is found to be directly related to the capability of financial institutions. It is therefore observed that the overarching challenge of ”Capability” covers both the abilities of small-scale farmers, as well as financial institutions, concerning small-scale horticultural credit provision. Both will have to be developed in order to improve the financial inclusion of small-scale farmers.

### Credit products

The insights related to ”Required income”, ”Interest rates”, and ”Tailored products” are found to be directly related to the overarching challenge surrounding credit products. Existing credit products are not tailored to the needs of small-scale farmers. Traditional loans require large cash flows and credit histories which do not align with the informal circumstances in which small-scale farmers tend to live and the lower incomes they earn. Furthermore, micro-finance loans only offer short durations and require frequent repayments, while farmers have an erratic, seasonal income. Finally, the interest rates that are offered with loan products are not affordable for many small-scale farmers. Therefore, loan products must be implemented that are more suited to the needs and characteristics of small-scale farmers, for their financial inclusion to be improved.

### Risk management

The insights related to ”Securities”, ”Risk perception - sector”, ”Risk perception - funds diversion” and ”Risk perception - trust” are all found to relate to the overarching challenge of risk management. Small-scale farmers are subject to unique covariant risks. These risks consist of production risks that stem from weather dependency or pests and diseases, or price risks that are related to the marketing methods small-scale farmers use. These risks endanger the primary income source of farmers and cause financial institutions to resort to a heavy reliance on securities. However, traditional collateral requirements are difficult for small-scale farmers to comply with and joint liability structures can also pose difficulties. Furthermore, financial institutions face risks of funds diversion, which is exacerbated by a lack of trust in customers. This results in many complications during the loan selection and monitoring processes, and thus risk management will have to be addressed in order to improve the financial inclusion of small-scale farmers.

# 6

# Conclusion

Small-scale farming systems play a crucial role in enhancing livelihoods, reducing poverty and ensuring food security in emerging economies (World Bank, 2008b), particularly with the challenges posed by a rapidly expanding population and the increasing influence of climate change (FAO, 2016). However, smallholders face a crucial problem of limited access to credit products, which are essential to adopting improved farming practices and technologies (Goldman et al., 2016; World Bank, 2008b).

This study set out to contribute to the knowledge of financial inclusion of marginalised groups in low- and middle-income countries, by specifically addressing the limited credit provision to small-scale horticultural farmers in the region of Kumasi, Ghana. Building upon established dimensions incorporated in the hierarchical model of financial inclusion, the study confirms the influence of several previously identified themes by introducing specific factors and in-depth insights relevant to the case context. Notably, the study incorporates factors arising from information asymmetries and trust, which are not commonly found in traditional financial inclusion models. This contribution is visualised in figure 6.1. By doing so, this study aims to fill a gap in qualitative research on financial inclusion by exploring the personal experiences, interpretations, and behaviours of both small-scale farmers and financial institutions. These in-depth insights are particularly valuable for designing tailored strategies to improve the financial inclusion of marginalised groups.

The chapter offers the answers to the research questions posed in chapter 1. It is organised as follows. First, section 6.1 discusses the answer to the first research question, which covers the factors that influence the financial inclusion of commercial horticultural smallholders. Second, section 6.2 delves into the answer to the second research question, which relates to the challenges that hinder financial inclusion. Finally, section 6.3 answers the third research question by oultning several pathways that hold the potential to improve financial inclusion.

## 6.1. Factors of financial inclusion

This section provides an answer to the first research question:

> RQ1: What factors influence the financial inclusion of commercial horticultural smallholders in the region of Kumasi, Ghana?

The results of this study build upon the initial hierarchical model of the dimensions of financial inclusion, visualised in figure 2.1, by confirming the influence of previously established dimensions and themes, and contributing specific codes and in-depth insights. To answer RQ1, the factors relevant to financial inclusion thus have been categorised by dimensions, themes, and codes that are specified with in-depth insights.

First, the results of this study confirm the relevance of access, usage and quality dimensions. The themes and codes are discussed according to their dimension.

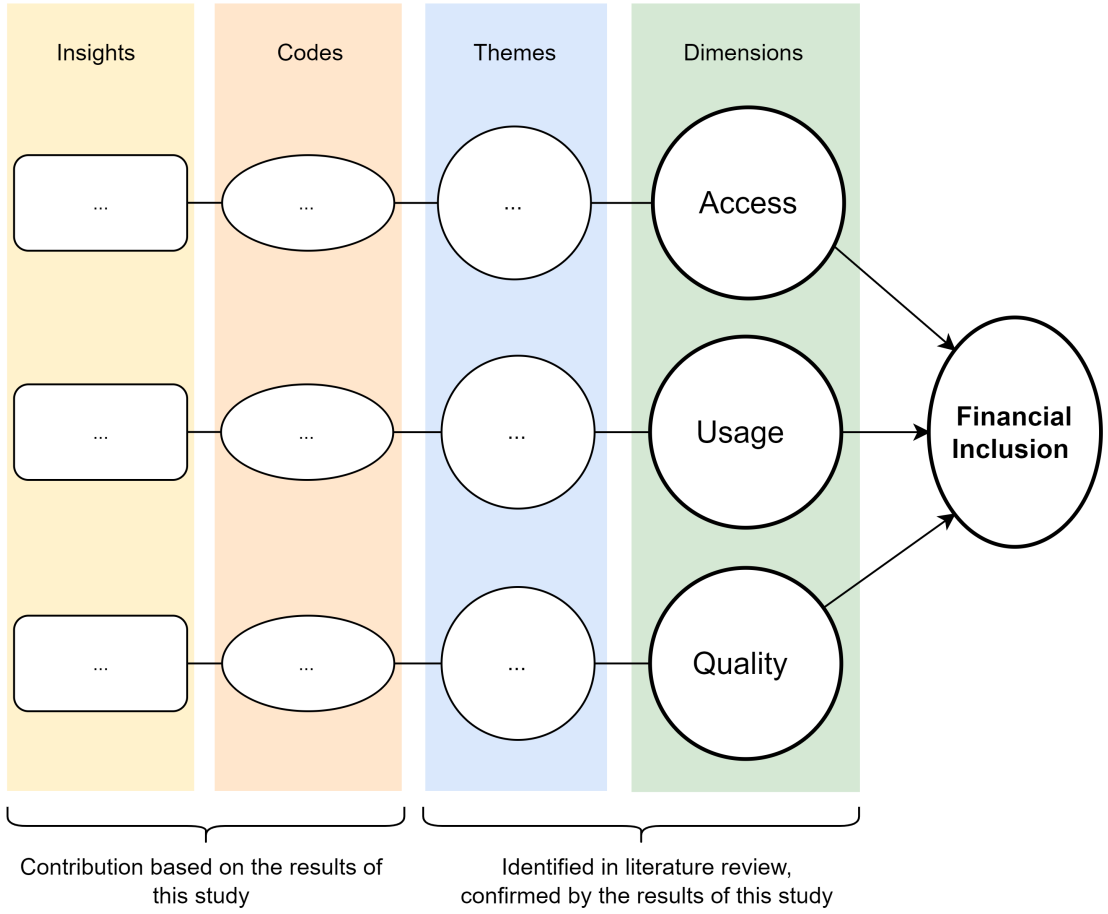


**Figure 6.1:** Visualisation depicting the contribution of this study to the hierarchical model of financial inclusion, own image.

Access

First, access is confirmed as a dimension that influences the financial inclusion of small-scale horticultural farmers. The relevant themes and codes under this dimension have been visualised in figure 6.2.

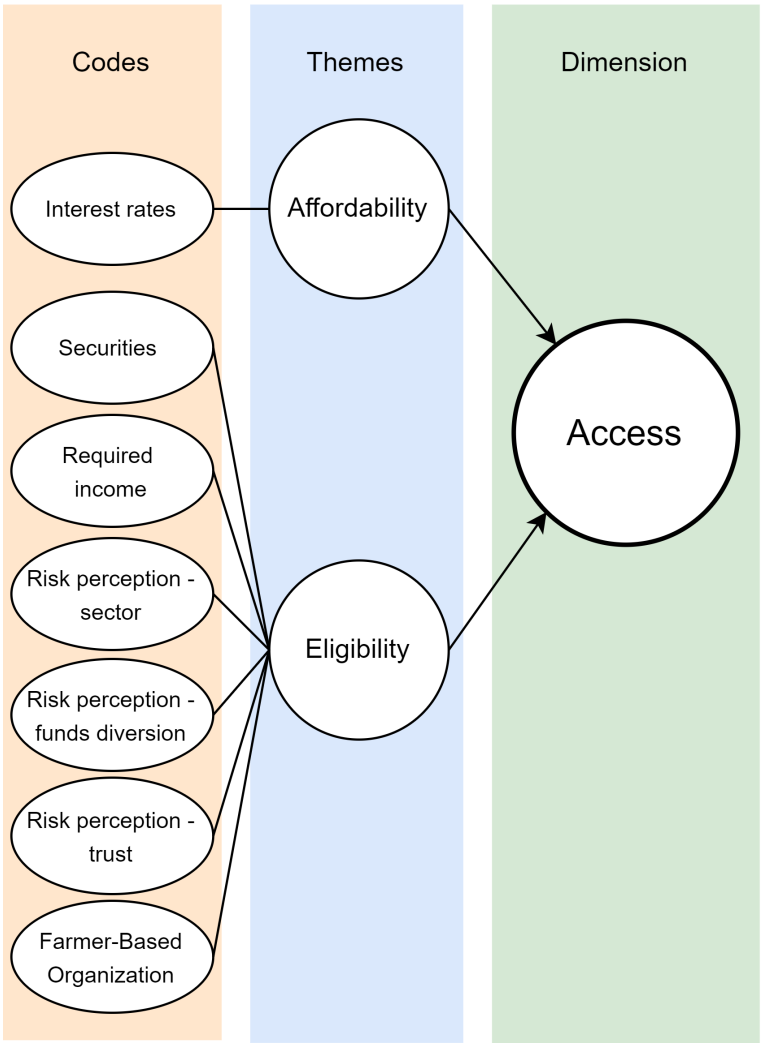


**Figure 6.2:** The themes and codes, originating from the case study, that are found to influence the financial inclusion of small-scale farmers under the access dimension, own image.

Within the context of the case, it was found that high interest rates limit the affordability of credit products, negatively influencing the access to financial products, and consequently limiting the financial inclusion of small-scale farmers. It was found that farmers experience difficulties complying with the security requirements of financial institutions, being collaterals or group forms. Also, financial institutions require income cash flows and credit histories not commonly found among small-scale farmers. Furthermore, financial institutions have a perception of high risk concerning the credit provision to small-scale farmers. This is a result of the sectoral covariant risks associated with small-scale agriculture, the high risk of diversion of funds, and the associated customer credibility issues that undermine trust. Also, the role of FBOs is confirmed to positively affect knowledge sharing among farmers and loan application procedures. All these factors have been found to influence the eligibility requirements small-scale farmers have to meet, limiting their access to credit products.

The confirmed influence of the risk of diversion of funds shows that credit market problems arise that stem from information asymmetries and transaction costs. Financial institutions emphasise their perception of a high risk associated with ex-ante moral hazard, particularly in the form of a diversion of funds, which results in challenges for the loan selection and monitoring processes of financial institu-

tions, increasing their transaction costs. This, combined with a perception of high covariant sectorial risks associated with small-scale agriculture results in excessive credit rationing and over-reliance on collateral by financial institutions when it comes to credit provision to small-scale farmers, negatively influencing their financial inclusion.

Also, the results show that flawed customer credibility can undermine the trust of financial institutions. This, in turn, prolongs, complicates, and hinders loan selection and monitoring procedures, which may have a negative influence on the financial inclusion of small-scale farmers.

Usage

Second, usage is confirmed as a dimension that influences the financial inclusion of small-scale horticultural farmers. The relevant themes and codes under this dimension have been visualised in figure 6.3. Within the context of the case, it was found that small-scale farmers suffer from a lack of financial resources to realise business growth and improvement, highlighting a need for credit, which adds to the usage dimension.

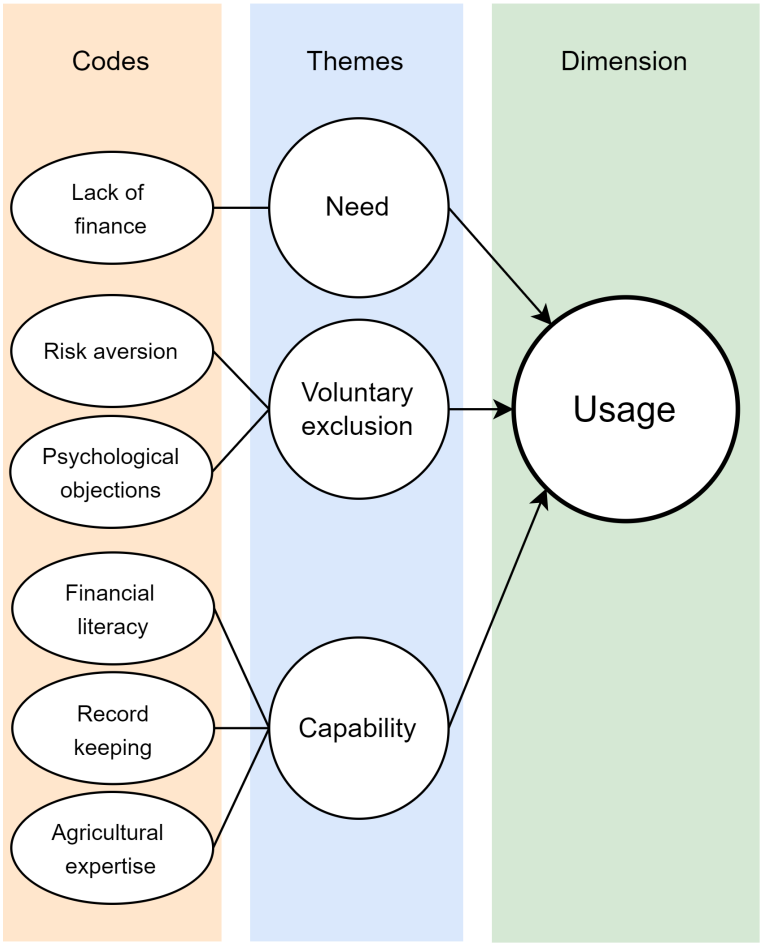


**Figure 6.3:** The themes and codes, originating from the case study, that are found to influence the financial inclusion of small-scale farmers under the usage dimension, own image.

Additionally, it was found that risk aversion and psychological reasons result in small-scale farmers refraining from using credit products, which is referred to as voluntary exclusion, adding to the usage dimension, and establishing their influence on financial inclusion. Finally, the limited financial literacy and record-keeping skills of small-scale farmers, as well as the limited agricultural expertise of financial institutions, result in a limited capability to use and supply the appropriate credit products, negatively influencing financial inclusion.

### Quality

Third, quality is confirmed as a dimension that influences the financial inclusion of small-scale horticultural farmers. The relevant theme and code under this dimension have been visualised in figure 6.4. Within the context of the case, it was found that there is a limited supply of credit products that are tailored to the needs and characteristics of small-scale horticultural farmers. This results in limited suitability of these products, which influences their quality. Thus, the influence of tailored products and suitability on the financial inclusion of small-scale horticultural farmers is established.

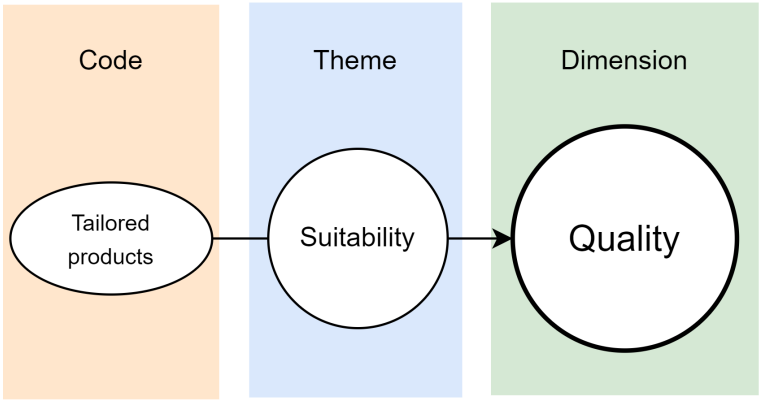


**Figure 6.4:** The theme and code, originating from the case study, that are found to influence the financial inclusion of small-scale farmers under the quality dimension, own image.

## 6.2. Challenges to financial inclusion

This section provides an answer to the second research question:

> RQ2: What challenges hinder the financial inclusion of commercial horticultural smallholders in the region of Kumasi, Ghana?

In the comparison of the results, discussed in 5.3, a re-categorisation of the codes identified in sections 5.1 and 5.2 was made to identify critical overarching challenges that must be overcome in order to improve the financial inclusion of small-scale farmers. The resulting challenges relating to capability, credit products and risk management are discussed.

1. Capability

It can be concluded based on the results from this study that financial institutions lack technical expertise in agriculture, horticulture in particular, as well as agronomy. At the same time, small-scale farmers lack financial literacy and record-keeping skills. This poses a challenge to the financial inclusion of small-scale farmers.

2. Credit products

Traditional credit products require large cash flows and credit histories that conflict with the informality in which small-scale farmers generally live. Microfinance techniques are often based on short durations and frequent repayments, while farmers have an erratic, seasonal income. The interest rates offered with credit products are not affordable for small-scale farmers. Therefore, it is critical for the improvement of the financial inclusion of small-scale farmers that loan products are implemented that are more suited to the needs and characteristics of small-scale farmers.

3. Risk management

Small-scale agriculture is subject to unique covariant risks related to the sector. This creates a strong reliance on securities like collateral and group-form loans that are difficult to comply with for small-scale farmers. Furthermore, financial institutions face large risks of funds diversion, which is exacerbated by their experience with untrustworthy customers. Therefore, it is critical to develop effective risk management models in order to be able to improve the financial inclusion of small-scale farmers.

## 6.3. Pathways to improve financial inclusion

This section provides an answer to the third research question:

> RQ3: What are possible pathways to improve the financial inclusion of commercial horticultural smallholders in the region of Kumasi, Ghana?

In response to the three challenges formulated in section 6.2, three strategic pathways for improvement are formulated. Successful financial inclusion strategies enhance the accessibility of the services in question, and, at the same time, make them attractive enough to elicit demand (Villarreal, 2018).

1. Strengthening capabilities

On the supply side, financial institutions need to recognise the opportunities that lie within the financing of the horticultural sector and build technical expertise specific to agriculture and horticulture. This will enable the development of products and risk management models tailored to the needs of the sector. Given the unique risks and characteristics of agricultural production and supply chains, bankers serving the segment require the development of specialised credit skills and policies, credit scoring and rating tools, and portfolio monitoring practices. It may also be necessary to utilise agronomists and value chain specialists to provide research and analysis of key agricultural sectors. Lastly, rural financial institutions need special attention to improve professionalism, governance, and management to remain a key link to the rural client base. Because it is uncommon for a banker to also be an agricultural specialist, a possible strategy could be to hire and train agricultural extension officers as bankers. It is crucial that loan officers can connect with farmers and properly assess their agricultural and management skills.

On the demand side, it is important to strengthen the capabilities of farmers and FBOs to facilitate access to finance and improve the efficiency of value chains. Training in basic farm economics, financial literacy, organization, governance, business management, and financial skills promotes the development of economically oriented farmer associations or cooperatives. Effective organization of farmers focused on commercial activities brings structure to value chains, allows farmers to pool resources for purchasing and marketing power, supports collective risk management efforts, and provides a proper intermediary through which financial institutions can finance the production of smaller farmers. Well-organised farmer groups also ease the delivery of valuable extension services, training in improved agronomic and husbandry practices, certification, and other forms of technical assistance to improve productivity.

2. Implementing tailored credit products

Another strategy involves the design of financial products that are better aligned with the needs of small-scale agricultural farmers. This strategy reflects the basic characteristics of this population segment: low, erratic, and seasonal incomes, which are unpredictable and difficult to prove, and possession of assets that are not easily tradable. A common barrier that hinders the development of these products is the high risk perception associated with the agricultural sector, in particular weather- and price-related risks.

A population with such characteristics needs financial products to match the liquidity of the target population (Labie et al., 2013). Yet, this is not a typical feature of traditional banking products or those offered by institutions that use microfinance techniques. The former offer saving products requiring minimum balances, credit histories, and prior documentation, which conflicts with the informality in which small-scale farmers generally live and with the time frames required to meet urgent needs. On the other hand, financial institutions use microfinance techniques, the most common being short-term loans, with periodic payments (sometimes daily or weekly after receiving the loan) of constant amounts, with phased loans and zero tolerance for missed payments. The characteristics discourage the implementation of longer maturity, making it necessary to take out several loans while ignoring the high vulnerability to income shocks.

This lack of flexibility among institutions that use microfinance techniques reflects to some extent the credibility issues some customers display, and the resulting pursuit of discipline in the client while reducing operating costs. However, given the characteristics of the population that is intended to be included, a degree of flexibility in financial products can benefit potential customers and the financial institutions that serve them. Adequate flexibility can increase the likelihood of repayment, encourage

funds to be channelled into high-yielding projects, and diminish the attractiveness of informal lenders (Mallick, 2012).

Financial institutions can enhance value chains by offering a full range of services, improved product design, transparent pricing, direct disbursement to farmers, and cross-selling. These value chain finance linkages reduce agricultural lending risks and may come to serve as collateral substitutes. Loan appraisals could become more focused on assessing the cash flow created by the value chain transactions and the strengths and profitability of the entire chain, rather than solely on the creditworthiness of the individual borrower as applied in mainstream lending.

3. Developing effective risk management measures

Flexible credit products tailored to the needs of small-scale farmers call for innovative models to manage the associated increased levels of risk. Innovation can be the adaptation of existing and established models to the local context of lower-income emerging markets. Thus, innovation is not only about new models or those not yet used globally (IFC, 2012). To manage potential risks for agricultural borrowers, insurance and forward contracts could be used.

Small-scale farmers face several production risks that can influence their income and capability for repayment. In particular, risks stemming from weather dependency, like crops being destroyed by floods or drought, are burdensome to small-scale horticultural operations. Production insurance, like crop insurance, can be a solution. Innovative index-based insurance products are based on locally recorded weather data and can provide a payout in case a certain weather index threshold, e.g. the level of rainfall, is exceeded. By charging all buyers in the same region the same premium rate per dollar of coverage, as well as providing the same rate in case of payout, index-based insurances avoid moral hazard and adverse selection problems. Furthermore, as they require no on-site inspections or individual loss assessments, they reduce transaction costs.

Additionally, marketing-related price risks can be managed using commodity market instruments. These instruments exist so that market actors unwilling to carry price risk can transfer it to actors who are willing to carry or manage the risk based on expectations of the opportunity to make a profit by doing so. Such activity takes place either on a physical basis, through commercial trade of the actual commodity itself (e.g., physical delivery forward contracts), or on a financial basis through instruments specifically developed for the purpose of risk transfer.

Financial institutions need to adjust and adopt appropriate systems to assess farmer credit risks and understand the overall risks of the specific category of farmers they are targeting. Overall risks beyond credit should include price, weather/yield, and health, among the most important ones. Approaches to credit risk assessment can include information about farmers from value chains or producer organizations, building specific scorecards for farmers (in some cases for specific crops and types of farmers), and incorporating agronomic information and derived cash flows.

Financial institutions need to be flexible in terms of collateral requirements, relying less on real estate and more on movable forms of collateral or, in certain cases, on future cash flows in Agricultural Value Chain Financing (AVCF) schemes. A more flexible approach to collateral can increase reach so that financial institutions can lend to more farmers. However, this should be done prudently, with the financial institution relying on robust and appropriate credit assessment systems to ensure that farmers have the ability and willingness to repay.

# 7

# Discussion

This chapter provides a discussion of the results. Section 7.1 reflects on the results of the case study. Section 7.2 discusses several limitations this research is subject to. Finally, section 7.3 makes several recommendations for further research.

## 7.1. Reflection

The conclusion of this study, discussed in chapter 6, presents a more elaborate hierarchical model of financial inclusion by confirming dimensions and themes identified in the literature review, section 2.1, and introducing specific relevant factors and in-depth insights resulting from the case study. This section reflects on the results offered in the analyses of demand and supply, as well as their comparison.

### 7.1.1. Analyses of demand and supply

This subsection offers a reflection on the analyses of demand and supply by comparing their results with the themes that were initially identified in the literature review for each dimension.

#### Access

The literature review of this study, discussed in section 2.1, describes that the access dimension relates to themes like the ease of physical access, eligibility requirements and affordability of financial products.

First, the results of this study do not indicate ease of physical access to be a factor influencing financial inclusion, as it was neither brought up by small-scale farmers nor financial institutions. This is contested by much literature (e.g. Claessens (2006) and World Bank (2007)), particularly by studies that focus on rural areas. The explanation could be given that the research setting of this study, the Ashanti region, is one of the more urbanised and developed regions of Ghana. Furthermore, the interviews were conducted in and around the city of Kumasi, and while trips were taken to the countryside, completely rural areas were not reached due to logistical reasons. It is therefore emphasised that while ease of physical access was not concluded to be a factor influencing to financial inclusion in the context of this study, this might not be the case in other, particularly rural contexts.

Second, the influence of eligibility requirements on financial inclusion was confirmed by the results of this case. While securities and sectorial risk perceptions are more common topics under this theme, they are particularly emphasised in this case study. This can be attributed to the focus of this study on small-scale farmers, which is quite specific when compared to financial inclusion studies that have a more general focus on low-income groups. Small-scale farmers are subject to several unique risks because of the nature of their agricultural business. It is observed that a small-scale agricultural business is generally perceived to be more risky than a provision business. This can explain the fact that risk perception has a more prominent role in the model for the financial inclusion of small-scale farmers than for other target groups active in other sectors.

Furthermore, this study highlights the influence of risk perceptions stemming from the risk of diversion of funds and lack of trust, both of which are less commonly incorporated in the existing frameworks for

financial inclusion. This can attributed to the specific focus of this study on credit provision, as opposed to other financial services that are usually covered in financial inclusion literature, like savings accounts and insurance. As outlined in the literature review, section 2.2, credit markets, from a theoretical point of view, can function differently than other markets. The problems that stem from information asymmetries like moral hazard, and the resulting credit rationing that can occur, are reasonably well confirmed by this study. While these problems are not usually incorporated within existing models of financial inclusion, the specific focus on credit products featured in this case study shows that it can be an important factor that could be incorporated when studying financial inclusion on a more general level. More explicit accounting for information asymmetries could point to other strategies of improvement like developing a functioning financial infrastructure, which is now less often taken into consideration as a determinant of financial inclusion (Tissot & Gadanecz, 2017). For instance, robust, safe, efficient and widely accessible information and communication technology infrastructure is a key factor underpinning the provision of credit products, as well as other financial services.

Additionally, the results also show how credibility issues with customers can undermine the trust of financial institutions, affecting their financial inclusion. Moreover, some customers may fear potential harassment by financial institutions, indicating a degree of institutional distrust. Trust is not usually explicitly incorporated in financial inclusion frameworks. While the influence of trust on financial inclusion has been studied, e.g. by Xu (2020), these studies usually focus on the trust of customers towards financial institutions, not the other way around. Ghosh (2021) conclude that a more explicit incorporation of trust in policymaking can lead to much greater awareness and appreciation of the relevance of trust, which contributes to an enabling environment that proactively addresses the financial inclusion agenda.

Finally, the influence of affordability, specifically as a result of interest rates, was established. That interest rates for general and agricultural loans in Ghana are especially high, is confirmed in a recent study by Dziwornu et al. (2024), who observed that agricultural loans average at 30.33%, compared to 18.15% in Kenya and 20% in Nigeria. This study also confirms that the risk premium plays a substantial role in the pricing of agricultural loans, which indicates an increased level of risk aversion of the banks toward providing credit to the sector, which is in accordance with the results of this study.

#### Usage

The literature review of this study, discussed in section 2.1, describes that the usage dimension captures themes that influence the actual consumption of financial products one might have access to. These themes have been identified to be need, voluntary exclusion, and capability.

The relevance of all of these themes is confirmed by the results of this case study. While risk aversion and psychosocial reasons were established to be a cause of voluntary exclusion, the literature studied in section 2.1 also shows that cultural or religious reasons can also influence this decision. While this was not explicitly discussed, the farmers that were interviewed are assumed to be Christian, as the majority of Ghanaians are. No indications were found that this, or the Ghanaian culture influenced the decision of farmers to use or disregard the use of financial services, though no conclusive statements can be made on this topic based on the results of this study.

#### Quality

As discussed in section 2.1, the quality dimension relates to themes like the perceived usefulness of financial products, customer satisfaction, and the suitability of a product to a specific customer. The results of this study only confirm suitability to be a relevant theme under the quality dimension. An explanation of why this dimension is less extensively featured in the codes and themes when compared to access and usage, might lie in the fact that most of the small-scale farmers who were interviewed for the case study did not have any experience with credit products. It is more difficult to discuss the perceived usefulness of or customer satisfaction with a financial product when an individual has no experience with it. Triki and Faye (2013) confirm that data on quality might be harder to obtain in cases where access and usage are low.

#### Impact

In section 2.1, the literature review of this study provides a full description of financial inclusion and identifies four dimensions. It is explained that the impact of financial inclusion captures the outcomes

that occur as a result of using a financial service. Themes under this dimension are improved livelihood, welfare and business development. However, the results and conclusion of this study do not address this dimension.

This is attributed to the fact that almost none of the research participants enjoyed proper financial inclusion, actually using credit facilities, or any financial service at all. This resulted in a degree of speculation when discussing the impact of financial inclusion (”What would you imagine to be the effect of using credit?” etc.), and it was therefore opted to leave this out of the results.

While existing literature, described in section 2.1, often relates this dimension with the outcomes of having financial inclusion, which is also done in this study, an argument could be made that it is also important to consider the negative consequences of not being financially included within this dimension. The absence of financial inclusion can lead to many challenges and adverse outcomes for individuals and communities. For example, without access to formal financial services, farmers may resort to informal and often exploitative financial practices with high interest rates (Awunyo-Vitor et al., 2014). Furthermore, farmers that lack access to credit tend to undertake investments in less risky and less productive technologies, rather than in more risky, productive ones (Dercon, 1998). This can increase cycles of debt and financial vulnerability, ultimately exacerbating poverty and inequality.

While it is not addressed in the results and conclusion of this study, the impact of financial inclusion remains a very valid topic. The underlying assumptions of financial inclusion policies almost always point to their potential to increase welfare, promote business development or enhance incomes. However, the evidence on the impact of financial inclusion by itself is not necessarily conclusive. In the particular case of credit provision to small-scale horticultural farmers, studies show quite some heterogeneity on this topic, with evidence suggesting that financial inclusion in itself might not be a goal worth striving for, and might have less positive effects on farm productivity and welfare than expected. Furthermore, some studies conclude that simply enabling loan provision can simply lead to increased debt when it is not properly paired with education on improved agronomic practices and quality inputs (Quartey et al., 2012). IFC (2011) advocate for financing to only be a part of a larger package of services to small-scale farmers that focuses not only on financial but also on non-financial needs. These services could include technical agronomic assistance, the facilitation of better quality inputs and training, sustainability certifications, and market/price information. Taking the impact of financial inclusion explicitly into account can emphasise the idea that financial inclusion should not seen as a goal in itself, but rather as a model from which strategies can be devised that serve higher goals.

### 7.1.2. Comparison

This section offers a reflection on the comparison of the analyses of demand and supply, discussed in 5.3. Concerning the themes, from figure 5.8 it can be observed that from all the identified themes, only the ”need” theme did not emerge in both the analysis of demand and supply. This theme covers the ”lack of finance”-code that relates to farmers identifying lack of credit as a limitation for business growth or improvement. From this, it can be concluded that this theme is more related to small-scale farmers, who are studied in step 1, which explains why it only emerged in step 1. This is not necessarily surprising, as it seems up to the farmers to either confirm or deny their own need for credit. The fact that all the other identified themes have emerged in both research steps, adds to the internal validity of the case.

Concerning the comparison of the codes, visualised in 5.9, it can be observed that four codes only emerged from either step 1 or step 2, while six codes emerged from both steps. The codes that have been confirmed by both steps may have a higher internal validity. However, the fact that some codes only emerged in a single step could also emphasise that their insights hold more value for a specific target group, be it small-scale farmers or financial institutions. What is particularly notable is that financial institutions have brought up the code ”Psychological objections” which relates to the fear some small-scale farmers might have of being harassed by financial institutions when loans are not repaid on time or at all. This shows that financial institutions are willing and able to critically reflect on practices that occur within their sector.

In the re-organization of the codes, visualised in 5.10, the codes have been categorised to identify three overarching challenges: capability, credit products and risk management. Two codes were disregarded

in this categorisation, the code under need, ”lack of finance” was disregarded. It is emphasised that this should not suggest that need is a less important theme. It is acknowledged by this study that need is a fundamental theme, and should always be established. It is not too hard to imagine why financial inclusion policies should always prioritise those who need financial services. In the context of this case study, it was established in earlier phases that the particular segment of small-scale farmers under study needed financial resources. However, it is noted that it is always wise to confirm this during the interviews themselves, and not just based on literature. Also, the code ”Psychogological objections” was disregarded. As stated in 5.3, this does not imply that the underlying topic should be underestimated. However, in the context of this study, it was found that the data collected on this topic was not comprehensive enough to make a proper judgement on the character of this issue and suggestions on how to improve it. Following this reasoning, it was disregarded.

## 7.2. Limitations

This section discusses the limitations of this study. These limitations are categorised based on the topics of research design, participant selection, interviews, financial inclusion framework, and pathways for improvement.

### Research design

The qualitative nature of the case study research design results in the important impossibility of establishing the relationships between the described phenomena in a quantitative or authoritative manner. That means this study only suggests the existence or nature of a relationship, which must always be seen within the specific context of the case study. This has heavy implications for the generalizability of the results obtained in this study. Furthermore, the interviews were conducted within a short, specific time frame, which must also be taken into account when interpreting the results. The study has aimed to provide a thorough description of the context and background of the case study so that clear distinctions about the usefulness of particular insights can be made.

### Participant selection

The interviews represent a relatively small sample size, and it is not intended or suggested to be representative of either small-scale farmers or the formal financial sector of Ghana. In particular, the selection of farmers is based on the convenience of the professional network relations of KAC and HGT. Some of these farmers are connected to the project in the role of ”lead farmer”, which means that they implement best practices in horticulture with the support of KAC and HGT, and share this knowledge with other farmers. Therefore, these farmers can be characterised by an increased degree of motivation, seriousness concerning their business, and willingness to improve practices. This may be atypical for the average small-scale horticultural farmer in Ghana. However, the interviewed farmers do fall within the given definition of commercial smallholders, outlined in 2.3, and it remains unclear how these character traits and their involvement within the project influence the factors that this study has focused on: those related to financial inclusion.

### Interviews

While conducting the interviews, the cultural differences between the researcher and participants must be considered. The interviews were conducted in English, often not the best language of the interviewees, which might have limited their ability to express themselves optimally. Specific wordings or subtle nuances in the answers might have been lost. Furthermore, it is difficult to guarantee the absolute sincerity of all the answers, even though the researcher has had no indications to suggest otherwise. The fact that the interviews were recorded with an audio recording device may also have influenced the answers given by the interviewees. However, comparing all the answers given within the case aimed to establish a certain degree of internal validity.

### Financial inclusion framework

While financial inclusion refers to all financial services, this study has made an important simplification to put a strong emphasis on credit provision, a subset of financial inclusion, and used information on other services, like possession of savings accounts, only as an indicator of financial literacy. The decision to use this simplification is not intended to imply that other financial services, like savings accounts or insurance, are less important, valuable or crucial in the pursuit of achieving financial inclusion and

its associated goals. In any case, the results of this study acknowledge the need to develop complementary financial services in combination with credit products, to best suit the needs of these customer groups.

The financial inclusion dimensions described in the study depend on conceptual definitions with borderlines that are not too precise and vary quite a lot throughout the literature. Distinctions between access and usage can be hard to determine. Sometimes this comes down to the subjective assessment of the researcher, also when categorizing factors under the labels of these dimensions. The study did aim to be as transparent as possible about the decisions that were made in this process.

Due to the explicit focus on the supply and demand of the credit market, this study fails to take into account several other factors that could be of importance for the provision of credit products, and therefore also sustainable financial inclusion. For example, geographical, environmental and political factors can also play an important role: national policies regarding regional autonomy may determine the extent to which far-flung regions of a country are within easy reach of telecommunications or other infrastructure networks. Also, the legal aspects of financial infrastructure relate to the ease with which financial claims can be enforced in court. In the area of payment services, a sound legal infrastructure should include a user-friendly and effective recourse and dispute resolution mechanism to address consumer claims and complaints.

Notable is the fact that all the small-scale farmers who participated in this study are men. Similarly, with the exception of one representative, all participants from financial institutions are also men. Although it was not necessarily the goal of this study to consider the role of gender as a determinant for financial inclusion, there is significant evidence from academic literature that suggests a gender gap when it comes to financial inclusion (Atakli & Agbenyo, 2020; Demirgüç-Kunt et al., 2013; Zins & Weill, 2016), with women being less likely to be financially included than men. To increase financial inclusion, it is crucial to understand the channels that reduce women's access to financial services.

#### Conclusion - pathways for improvement

This study has a clear and explicit focus on the supply and demand side of the credit market, being small-scale farmers and financial institutions. However, these two groups are not the only ones relevant to financial inclusion. Furthermore, one can even question if formal, commercial financial institutions can be reasonably expected to be the main driver in expanding their financial services to small-scale farmers. The goal of commercial institutions is, in essence, profit maximisation. While the role of social lenders (defined as impact-driven smallholder agricultural lenders, see Caroll et al. (2012)), donors, and the government remains largely unexplored in this study, their part in improving financial inclusion is not to be underestimated.

#### Digital payment services

This research does not address the impact of digital payment services on financial inclusion. No specific interview questions were asked on this topic, and it was not brought up by any of the research participants. However, there is evidence that the expansion of "mobile money" in Ghana may have a positive influence on financial inclusion (World Bank, 2016). Furthermore, the number of users is rapidly growing: while World Bank (2016) reported 13% of Ghanaians having a mobile money account in 2006, statistics from 2021 show that already 62% of the Ghanaian population has used mobile money (Dabalen & Mensah, 2023).

## 7.3. Recommendations for further research

This section outlines several recommendations for future research, which originate from the limitations identified in this study and the observed shortcomings of the concepts under research.

While this study specifically focuses on small-scale farmers and financial institutions, it's essential to recognise that commercial financial institutions may not be the sole drivers of financial inclusion. Future research should consider the roles of other external stakeholders and systems that influence financial inclusion. This could include government institutions such as the Ministry of Finance or the Ministry of Food & Agriculture (MoFA), donor organizations, social lenders, and educational institutions. It can be interesting to incorporate their perspectives into strategic pathways towards improving inclusion.

Exploring the impact of specific national collateral regulations in relation to legal enforcement systems on the methods and contracts used by financial institutions could also provide valuable insights.

While credit provision is central to financial inclusion, future studies could adopt a more comprehensive approach by examining other financial services such as savings, insurance, and digital payment systems. This holistic perspective can offer a deeper understanding of the dynamics of financial inclusion and provide insights into the diverse needs of small-scale farmers.

This study highlights the significant impact of information asymmetries on credit provision to small-scale farmers. Integrating factors such as adverse selection and moral hazard into financial inclusion frameworks could lead to more effective strategies for improvement. Additionally, explicitly addressing credibility issues and the role of social trust may further enhance financial inclusion efforts.

While this study provides a comprehensive description of financial inclusion dimensions, the impact of financial inclusion remains underexplored. Future research could investigate the implications of financial inclusion efforts on welfare, business development, and incomes, particularly within the context of credit provision to small-scale farmers, and explore if additional measures are beneficial to develop small-scale farming systems.

Future work could also recognise the impact of environmental and climate factors on financial inclusion for small-scale farmers. An example could be to investigate how climate change, natural disasters, and environmental degradation affect farmers' access to financial services and their ability to manage financial risks. This could involve interdisciplinary research that integrates insights from environmental science, agriculture, and economics.

Also, the influence of digital payment services, like mobile money, on financial inclusion could be explored. The adoption of mobile money has been rapidly increasing over recent years. Furthermore, there is evidence suggesting that mobile money could positively influence the economic outcomes of small-scale farmers that are relevant for rural development and poverty reduction (Peprah et al., 2020b).

Finally, given the gender disparities in financial inclusion, future research can study gender-sensitive approaches to financial service delivery. Explore strategies to address barriers faced by women in accessing financial services, such as limited access to land, property rights, and cultural norms. Additionally, assessing the impact of gender-focused interventions, such as women's empowerment programs and targeted financial literacy initiatives, on promoting financial inclusion and women's economic empowerment.

# 8

# Practical application

As discussed in section 3.1, this thesis is part of the ACHI project, which focuses on the development of a training program that combines practical horticultural training with education on entrepreneurial skills. This program is targeted at young, motivated individuals who want to study horticulture and would like to find employment in the horticulture sector of Ghana, either as an entrepreneur/farmer or employed at an agricultural company/farm (TU Delft, 2024). Access to and usage of financial services, in particular credit, has been identified as a key enabler in the development of small-scale farming operations. This section uses the insights gained from this study to offer some practical recommendations and financing schemes that are focused on the partners within the project.

First, section 8.1 recommends several strategies that are based on the pathways outlined in section 6.3, and bases these on the important topics identified in the results of the case study. Section 8.2 summarises the actions and requirements stemming from the strategies offered in 8.1 for each specific partner. Section 8.3 elaborates on two financing schemes that could be adopted in the financing of small-scale farmers. Finally, section 8.4 offers a brief perspective on the long-term improvements that could be made.

## 8.1. Strategies

In the conclusion of this study, presented in chapter 6, three key challenges were identified, followed by three pathways to improve financial inclusion:

1. Strengthening capabilities
2. Implementing tailored credit products
3. Developing effective risk management measures

This section specifies these pathways and suggests several strategies and actions for specific partners within the ACHI project that could contribute to a program for the financing of small-scale horticultural farmers by local formal financial institutions.

Figure 8.1 visualises the relationships between the three pathways, demand and supply actors, the related codes identified in the results, strategies, and the suggested actors to take action. The strategies are discussed.

### Strengthening capabilities

First, it is recommended that the ACHI project raises awareness of the opportunities that lie within the financing of small-scale horticultural businesses in the local formal financial sector. Within the project, there are many examples of farmers, e.g. the ”lead farmers”, who have horticultural businesses that perform relatively well. The project could connect these farmers with local formal financial institutions by inviting representatives of financial institutions to these farms, to show off their operation. The idea is that by doing this, financial institutions might want to join a program where they finance (a few) horticultural farmers, which would allow them to learn from these farmers and build expertise

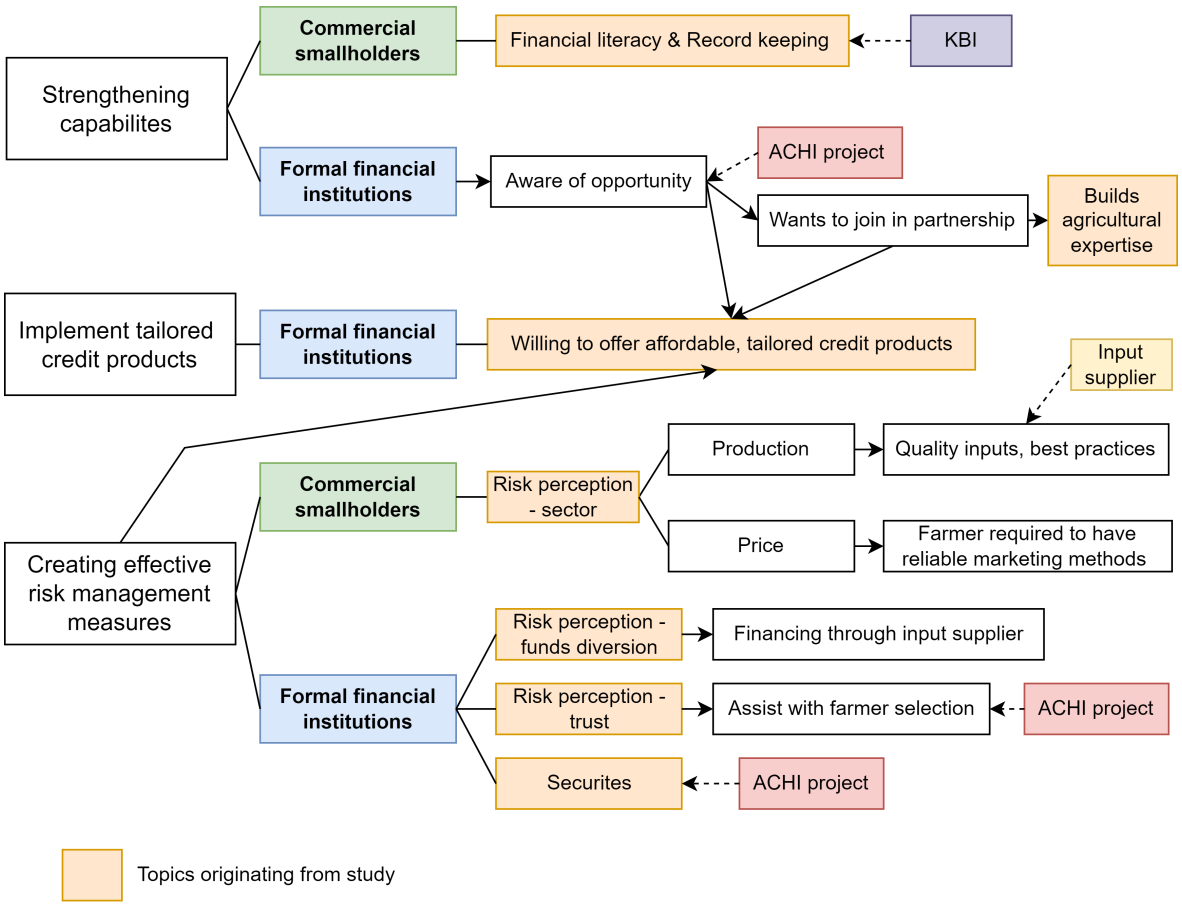


**Figure 8.1:** Relationships between the three pathways, demand and supply actors, topics originating from this study, which are marked orange, strategies, and suggested actors to deal with these topics, own image.

in agricultural businesses over time, which has been found to be critical for the financial inclusion of small-scale farmers in the results of this study. This covers one side of the strengthening capabilities pathway.

Additionally, this study also highlights the need to develop the financial literacy and record-keeping skills of small-scale farmers. Therefore, it is recommended that the ACHI project partners with a KBI that specialises in this aspect of financial knowledge. This institution can assist farmers who are selected for this program by teaching cost accounting, cash flow projection, cost price calculation and, most importantly, helping with the preparation of the farmers' business plan and their credit application. This will contribute to the other side of the strengthening capabilities pathway.

#### Implementing tailored credit products

This study emphasises that financial institutions offer credit products tailored to the needs and characteristics of small-scale farmers. By highlighting the opportunities surrounding small-scale horticultural finance, setting up a partnership with the financial institution, and creating proper risk management measures, which will be discussed further in this section, the goal is that the financial institution will be willing to reflect on its current loan conditions and develop a credit product that is affordable and suited to the needs of the small-scale farmer. This will cover the second pathway for improvement. Section 8.3 offers suggestions on the specific financing schemes that can be used.

#### Creating effective risk management measures

To create effective risk management measures, the smallholders should cover at least production and price risks, which have been found to be critical in the results of this study. This can be done in the following manner. To cover production risks, a partnership can be set up with an input supplier, like HGT, that can supply quality inputs (seeds, fertilisers, pesticides) and support the farmer by providing knowledge on the best practices associated with the inputs. This way the production risks are minimised and the farmer can maximise their chances of realizing the projected revenues. Furthermore, it should be required that the selected farmers for the program have a clear, determined market for their produce. This will ensure that accurate cash flow projections can be made, and price-related risks are minimised.

Concerning risk management on the supply side, important topics that have been identified by this study pertain to the diversion of funds, trust and securities. To avoid the possibility of a diversion of funds, a financing scheme can be used where not the farmer is financed, but the input supplier. This is further explained in section 8.3. Because the farmer will not directly receive cash, they have a limited ability to divert it to other purposes, and thus this risk is minimised. To deal with credibility and trust issues, it is recommended that the ACHI project assists the financial institutions with the selection of the farmers. The project already has experience with a lot of farmers and can use this by recommending farmers that they would deem fit to participate in a financing program. These farmers should have been performing well for a few years, preferably have some business management knowledge and record-keeping skills, and have shown credibility and commitment. This can minimise the risk related to the trust issues a lot of financial institutions might have.

Finally, concerning securities, it is highlighted in the results of this study that common security requirements like collateral or group structures can pose problems for small-scale farmers. The conclusion of this study states that the uncertainty surrounding the primary income of farmers results in an over-reliance on collateral. The idea of the program, which is roughly based on the principles of Agricultural Value Chain Financing, outlined in section 2.5, should be to emphasise the partnerships and to strengthen the linkages within the value chain. This can allow increased access to finance by basing credit assessments on predictable cash flows, flows of goods and strong relationships, instead of traditional collateral. However, it is recognised that, at least in the early stages, this can be challenging to achieve. Some complementary or alternative options are given: first, it can be a possibility that the ACHI project can act as a partial guarantor for the participating farmers, e.g. through a partial credit guarantee (PCG). It is emphasised that a partial guarantee might be preferred over a full guarantee. While the latter does avoid all credit risk for financial institutions, it is susceptible to moral hazard problems, because the farmers are now also exempt from any downside risk, which might limit their incentive to optimise the farm output. Another option: if the financing is used for materials or agricultural technologies, it can be explored to what extent these can be used as collateral. Finally, crop insurance could also be used as collateral and provide lenders with assurance against crop loss due to

natural disasters, pests, or other unforeseen events. It is imperative to make clear plans surrounding the measures that will be taken in this aspect with all the partners involved in the program.

## 8.2. Recommended actions and requirements

The actions and requirements stemming from section 8.1, are summarised for each partner that could be involved with the financing of small-scale horticulture within the ACHI project.

Small-scale horticultural farmer

- Has a well-operating farming business
- Preferably has some business management knowledge and record-keeping skills
- Shows credibility and commitment
- Needs to have a clear marketing plan for his produce

ACHI project

- Raises awareness in the local financial sector about the opportunities of financing small-scale horticulture
- Uses experience with farmers to help with the selection of farmers that are fit for financing
- Acts as overseeing partner, checks quality, can act as guarantor for the farmer if necessary
- Improves knowledge creation and education on horticulture and entrepreneurship by scaling up training programs

Local formal financial institution

- Willing to enter into a partnership with small-scale farmers
- Willing to learn and build expertise on small-scale agricultural businesses
- Willing to offer credit products tailored to the needs of small-scale farmers

Input supplier

- Provides farmers with quality inputs: seeds, fertilizer, proper (climate-smart) disease and pest control, and potentially improved technologies (irrigation technologies)
- Supports the farmer with knowledge of horticultural practices related to the provided inputs

KBI

- Assists the farmer with business skills – cost accounting, cash flow projections, cost price calculations - and helps with the preparation of the business plan and credit application

## 8.3. Financing schemes

This section outlines two different financing schemes that could be used within the context of the project. The first scheme, visualised in figure 8.2, offers a more traditional way of financing. In this scheme, the financial institution will deliver the cash loan directly to the commercial smallholder. The smallholder can use these funds to buy inputs from the input supplier and repay the loan after harvest.

The second financing scheme, visualised in figure 8.3, is a simplified example of external Agricultural Value Chain Financing (AVCF) (Miller & Jones, 2010), applied to the context of the project. In this scheme, the financial institution finances the input supplier who delivers the inputs to the smallholder. After harvest the smallholder repays the loan in the same fashion. The advantage of such a scheme is that the funds are guaranteed to be used for products supplied by the input supplier. This limits the influence of ex-ante moral hazard, in particular the risk of diversion of funds, which has been found to be crucial in the results of this study.

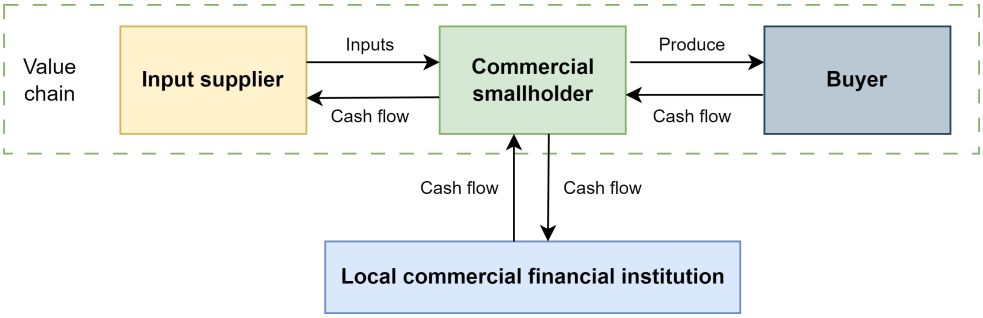


**Figure 8.2:** Traditional financing scheme, own image.

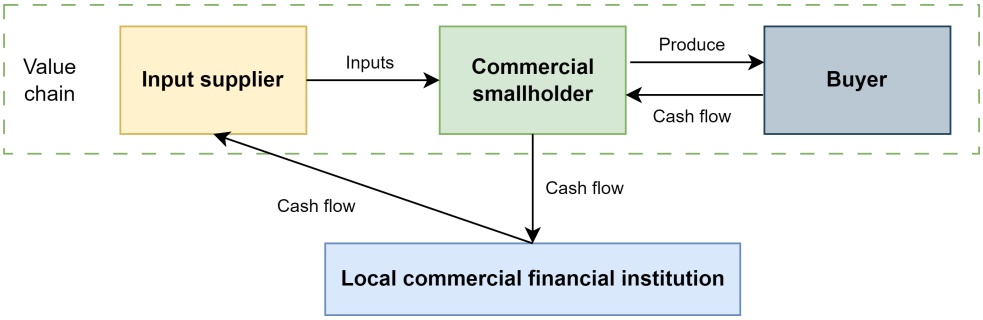


**Figure 8.3:** Financing scheme using value chain, own image.

## 8.4. Long term

The idea is that the input supplier and KBI first assist the farmer when their capability is limited with regard to horticulture, agronomy and business management. This is so an example can be set, the business reputation of small-scale horticulture can be improved and relationships with the local financial sector can be strengthened. Over the years, by building on these examples, and developing and scaling the training program, the ARCHI project can improve the capability of starting farmers in these areas. This can decrease the need to assist farmers in both knowledge categories in the future. Additionally, the results of this study also point to the role of Farmer-Based Organizations (FBOs). FBOs can foster knowledge sharing among their members, promote best practices in agronomy and entrepreneurship, and serve as risk-sharing facilities and aggregators for financial institutions.

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# A

# Interview guides

## A.1. Farmers

First, introduce myself, the thesis, and its goals. Explain the informed consent form and get informed consent.

Introductory questions

- What is your name?
- Where are we right now?
- About how big is your farm?
- Do you own the land yourself? (or is there another construction, e.g. renting?)
- What crop(s) did you grow past season?
- Do you always grow the same crop(s)?
- Do you farm one crop at a time or multiple crops?
- How do you manage the sales of your crops?
- Did you sell everything from your last harvest or did you keep something? Is that typical?
- Did you have any leftovers, if so what did you do with them?
- Do you work together with farmers in the neighbourhood? In what ways do you collaborate?
- Did you receive any education? If so, what levels (primary/secondary/university)?
- Do you participate in any other jobs besides farming?

Obstacles to growth

- Over recent years, have you been able to grow your business?
- What would you say are the challenges for your business growth?

Risk exposure

- What risks do you think your farm is most exposed to?
- How do you try to mitigate these risks?

Financial literacy & bank account

- How much did you earn from last season's harvest? Do the earnings differ a lot per season? If so, why is that?
- Do you keep records of your profits, expenses and sales?
- How do you manage your finances, do you have a bank account?
- What do you see as the main benefits of having a bank account?

- At what organization do you have your bank account?
- Would you want a bank account? Why (not)?
- If you want a bank account, what is stopping you from getting it?
- Having no bank account, how do you store your money?

Credit

- Would you want to use a loan to grow or improve your business? Why (not)?

Loan experience

- Do you already use any loans for your business?
- What kind of loan is it?
- From what organization?
- How much money do you receive from the loan? Is this the amount you wanted?
- How does the payback work?
- What do you use the loan money for?
- Does the financial institution check what you use the loan for?
- What did you have to do to apply for the loan?
- Did the financial institution require any collateral or income?
- Are you satisfied with the loan? Any suggestions for improvements?
- What are the challenges that have kept you from using a loan?
- What do you think would help you to get access to a loan?
- What would you use the money from the loan for?
- Why have you not used any loan?

## A.2. Financial institutions

First, introduce myself, the thesis, and its goals. Explain the informed consent form and get informed consent.

General info

- Can you please state the full name of this institution?
- What type of financial institution would you describe it to be?
- In what regions do you operate?
- What kind of financial services does this institution offer in general?
- In what business sectors are you active?

Availability of loans for agriculture

- Do you offer loan products to the agricultural sector? What percentage of total loans do you estimate it to be?
- What are generally the kind of customers you give out loans to in the agricultural sector?
- What kind of loan products are these?
- If not, why not?
- Do you have a specialized department that focuses on financial services for agricultural businesses?
- Are there experts on agronomy?

Loans for horticulture

- Do you offer loans to small-scale commercial horticultural farmers? What percentage of total loans do you estimate that to be?
- Are these loan products specifically designed for small-scale farmers? How do these work?
- If not, do you intend to, in the future, design products specifically for small-scale farmers to expand their businesses?

Challenges for loan provision to small-scale farmers

- What risks do you perceive as especially relevant when giving out loan products to small horticultural/agricultural businesses?
- How, as a financial institution, how do you manage these risks?
- What problems have you perceived in the past with lending to small farmers?
- What would the loan application process look like for a small agricultural business?
- On what criteria do you base the decision to either give or not give out a loan?
- What is expected of the farmer in this regard?
- Are small agricultural businesses generally able to meet these criteria?
- If not, in what aspect do they lack?
- Are there any income or collateral requirements that you specifically demand?
- After giving out a loan, do you monitor it in any way? How?
- Does the fact that a farmer might be part of a farming cooperative, change anything with regard to the loan assessment or monitoring?
- Do you perceive giving out loans to small agricultural businesses to be profitable?

# B

# Interview summaries

## B.1. Summary of interviews with farmers

Semi-structured interviews with 10 farmers were conducted to collect indicative information about the farmers' characteristics, their exposure to risks, obstacles for growth and their experience with or perception of financial services and loans.

### B.1.1. Farm characteristics

All interviewed farmers are defined as horticultural farmers in that they at least cultivate one or more horticultural crops. All farmers use intercropping (simultaneous cultivation of more than one crop on a single plot of land) and crop rotation (planting different crops sequentially on the same plot of land), to improve soil health, optimize nutrients in the soil, and combat pests and weed pressure (to not ''dry out the land'' and lower chances of crops infection). Farmers cultivate a large range of different horticultural crops depending on their preference, expertise or season. A few of the cash crops that were named significantly more often are tomatoes, bell peppers, cabbage, spring onions and lettuce.

All farmers confirmed that they considered farming to be their main business activity and primary source of income. Three farmers noted that they also participated in side jobs, being an architect, an electrician and an extension officer from the MoFA, but their main focus was still on farming. One farmer emphasized his experience with irregularities in the demand for other jobs:

"It is better to have side jobs, but farming is important. The farm is always there, other jobs aren't." (F7)

The farmers used plot sizes ranging from 0,4 to 4,4 hectares. Half of the farmers owned or co-owned their land, either by buying it alone or with a group, or inheriting it from family members. The others rented it either from a private owner, for example, another family, or the government. Two farmers temporarily occupied land that was owned by a private owner, but they could use it free of charge, though only until the owner made new plans for it.

Five farmers said they always worked alone on their farms. Others used either temporary or permanent labourers, ranging from 2 to 5 extra workers, who had different levels of familiarity with the farmer. One farmer explicitly made note of his desire to employ workers who speak different languages to limit mutual communication on the farm and avoid the distraction of workers:

"Now I have 2 workers, a month ago I was having 4, but they all spoke the same language, I had to lay off 2. I'm trying to get different languages, so that communication will be limited when they are working. Earlier they were communicating too much and not focusing on the work." (F8)

Half of the interviewed farmers were part of a farmer association. 3 farmers, one of whom is in the position of secretary, are part of a larger association with more than 300 horticultural farmer members located in the area of Kumasi. This organization owns an office building in the city and has received official recognition and financial support from the government. Members have to pay monthly membership fees and agronomic practices are standardized within the organization. Furthermore, they are certified

by the Ghana Green Label program, indicating that their produce is of certain quality and safety. Members highlight different benefits of their membership, for example: being able to access training (with fee), increased possibilities to get inputs like seeds, and financial support, and having the reputation of the association to be more “out there” and recognizable, e.g. when information is given out by MoFA.

The other association of which members were interviewed is smaller, with approximately 40 members. One farmer who was interviewed served as the acting chairman. This association is characterised by a more specific geographical location; all members used the same river as a water source. To become a member, you only have to be a horticultural farmer in the area, willing to become a member and give your name to the organization. Members also confirmed the organizational benefits of knowledge sharing, highlighting the possibility of following free workshops and the exchange of ideas during the monthly meetings. This organization was also recognized by the municipality and the local agricultural directors from the government.

Some farmers emphasized an explicit unwillingness to collaborate with other farmers. They attributed this to neighbouring farmers not being into horticultural crops, or not sharing the same kind of ambition and seriousness:

“Others local farmers have a different vision, they don’t want to innovate and don’t want to try new technologies. Also, they don’t have the needed resources for it. I feel that a collaboration would be discouraging for me.” (F1)

In terms of record keeping, some farmers didn’t record anything, some stating they would do it “in their head”. Others indicated that they kept a few general recordings of farming expenses, profits and sales. There was one farmer who kept records of his expenses and revenue per planted bed and per crop, and translated this to monthly earnings and expenses.

### B.1.2. Risk exposure

When asked to identify the risks of their farming business, almost all interviewed farmers pointed to the weather dependency of their agricultural methods and the risks associated with its unpredictability. In the rainy season, if the rain is too much, there would be a risk of the water flooding the farm. To combat this, farmers would dig channels to drain the water or raise beds on which crops are planted to protect them, but the limited available labour forces act as a critical limitation to their ability to complete this. In the dry season, there is the general problem of minimal rainfall, making irrigation a necessity. Most farmers used watering cans or gasoline pumps with a hose to do this. Furthermore, there is also the risk that streams will completely dry out, creating major difficulties for farmers who depend on these kinds of water sources.

The second risk associated with the nature of the agricultural sector is the chance of crop infestation. Insects can infect a whole farm in a small period of time. In multiple interviews, the use of appropriate pesticides and fungicides was identified as a crucial strategy to mitigate this. Also intercropping, to diversify risks, and crop rotation are named as countermeasures. One farmer elaborated on their procedures for spraying pesticides:

“We spray proactively. A plant may not look different, but once you start to see it, it is often too late. That why we use strict schedules when spraying chemicals.” (F4)

Another major risk is identified to be the shortage of inputs and resulting price fluctuations. Fertilizers are generally not produced in Ghana (check?) which causes price fluctuations to be exacerbated by exchange rates. Furthermore, multiple farmers indicate that a shortage of seeds forces them to replant produce, significantly reducing the amount they can sell. Price fluctuations in inputs like seeds, fertilizer, and pesticides are of direct consequence to the profitability of the farm at the end of the season.

Moreover, farmers experience risks when marketing their produce. In almost all cases, farmers will either bring their produce to a local market, or aggregators will pick it up at the farm. Either way, pricing is never regulated, which results in a large dependency on the supply and demand of a certain product at a certain time, the quality at which the product is presented, and the judgement of the buyer. Lack of appropriate cooled storage systems and poor infrastructure, in combination with the perishable and fragile nature of fruits and vegetables add to this problem. This makes it not only difficult for farmers

to make revenue projections at the start of a season but also exposes them to the risk of earning a minimal price for their produce.

"The price is normally determined by the time. When you plant at the right time, and you don't meet the market, the price is going to be different. That's how it is. (…) When it is raining season and the rain is falling, it is cheap for everybody to plant. So that time you won't get the price that you want, it will come down." (F9)

"I sell everything to the market women. They can make it difficult because their price is not good. Sometimes they suddenly half the price. If you want to expand, you make a plan, but price fluctuations can undermine your spirit." (F7)

The general lack of farmer organisation and abilities to make collective decisions with respect to the more structured collective of market women also enhances this problem for farmers. As one farmer points out: "The market women are more organised. The farmer groups can decide on something that they will do but somebody will pass you back, and go and do something else. If the women say something then everybody will agree, so they have the bargaining power." (F10)

Moreover, farmers who use extra labour forces run the risk of workers running away. Due to a lack of ability to construct formal contracts, combined with weak legal enforcement systems, there is less power with the employer to maintain worker agreements. This results in a general suspicion of farmers when employing new labour forces. Also, there is a general perception that it is best to pay workers monthly. It is believed that this will encourage workers to stay. However, most farmers are unable to pay monthly salaries as their main income follows after the harvest. Some farmers emphasize the need for trust when hiring:

"Maybe the person will come in and come from another place, the month will end and they just leave. You will fall down. It has happened to a lot of farmers here. So before you employ a person you have to be very sure. Know the person well, otherwise, this person will simply make you fall down." (F9) (Risk of theft omitted, named only by a few)

### B.1.3. Lack of access to credit provision as limitations for growth

The factor that is named consistently as a primary limitation for business growth is a lack of financial resources, though the reason for which funds would be needed differed significantly. Purposes named ranged from improved inputs like quality seeds and fertilizer, to new equipment, often in the form of irrigation systems, to the ability to afford additional labour forces, or the purchasing of new land to accommodate expansion.

One farmer mentioned explicitly a lack of other resources, like water and electricity that was limiting his ability to expand the business.

### B.1.4. Experiences with or perception of financial services and institutions

Of the interviewed farmers, three had used a loan in the past. One farmer described his experience with this facility, obtained from a rural bank, as positive, saying that he didn't have any trouble qualifying for the loan due to his membership with an FBO.

"The bank also came to the field. There was no need for audited accounts or collateral. They only wanted to be assured that the production and the records were okay. They checked that but after that, they didn't ask any questions again. They believe in the association." (F6)

He used the money to finance the salaries of workers and emphasized that this was his first time getting a loan. He repays monthly, explaining that he has enough cash reserves to make this possible. He only wanted a small loan at first, so that he would know for sure that he could repay. The next time he might get one bigger. The other two farmers who had a history with credit facilities from larger commercial banks described their experience as more troublesome, emphasizing the perceived stress to pay back, particularly monthly, high-interest rates, and difficulties to find the required guarantors.

Other farmers who did not have direct experience with loan facilities did make statements describing their perception of loan products and financial institutions. Some didn't go for loans because of the high interest rates, scared that they could not pay. Others stated the challenge of building a stable credit

history with a bank before qualifying for loans and wanting to have a secure and profitable business before taking on a loan.

"Maybe at times the interest was too high and I couldn't afford it. Others did go for it and they couldn't pay. If you know that you can work and take your profit and invest it then maybe it is better for you. You are secure and you have peace of mind because you know that it is your own capital. But as for banks, if you didn't meet the market, then you will fall down, and it will be a big problem for you. So before I will be going for such money I have to consider more things here. You have to be very sure before you go in for loans." (F9)

The farmers did mention that they believed longer grace periods and durations would improve their likeliness of getting loans from formal financial institutions. "We hope for loans that have a long duration and repayment period. I think then, many of us will go and do it. But now, these banks, they give you a loan, the best will be 3 months and they will be asking for money. Also, with a duration of 3 months, the grace period will be only 6 weeks. If you have a crop failure then it will be difficult to repay." (F8)

## B.2. Summary of interviews with financial institutions

In total, 11 financial institutions were interviewed to obtain indicative information about their characteristics, product offerings, loan selection and monitoring procedures, risk management, and experience with or perception of providing credit to small-scale agriculture. All of these institutions offer general financial services like savings and deposit accounts and loans.

### B.2.1. Institutional characteristics

The interviewed institutions can be categorized into 4 types, being commercial banks, development banks, rural banks and credit unions. These will be briefly characterised. Commercial banks are relatively larger institutions, with a bigger area of operations, national or international, that focus on services that primarily support commercial businesses in different sectors and different sizes.

The development bank was founded by the government with a specific focus on supporting the agricultural sector. However, the interviewee pointed out that over recent years the bank diversified to become a more general investor's bank, active in all sectors, though still holding a small emphasis on agricultural development.

Rural banks historically originate from the rural regions surrounding Kumasi and have been founded to support the communities living in these areas with financial services. However, the rapid expansion of Kumasi has resulted in urbanisation that led these banks to expand to a more urban-oriented customer base. These institutions still present themselves as community-based, which is also reflected in their product range, which will be discussed later. All rural banks that were interviewed have branches throughout but are limited to the Ashanti region. Many rural banks also support social development activities in the community where they operate. These activities include the financing of infrastructure such as school buildings, community libraries and community roads.

While credit unions also display the same community orientation as rural banks, they differ in their management structure. Credit unions are owned in full by their members, who have to lay in capital to buy a certain, minimum amount of shares to become a shareholders. With the share-ownership voting rights are attributed, and one is included in the decision-making process of the union. While credit unions generally allow anyone to hold a savings account, full access to all benefits and facilities is only given to members.

### B.2.2. Credit products

The discussed credit products are categorized and explained.

#### Microfinance loans

Rural banks offer microfinance loans to groups of individuals to finance SMEs like petty provision or cosmetics shop-owners, taxi drivers, mechanics etc. At some banks, the group is defined as the borrower, whereas for others each member of the group is the borrower. In both cases, the group is jointly liable for the repayment of the loan, which means all group members guarantee for each other. Interviewees emphasized the trust needed in fellow group members,

"A group of minimal 4 people, up to 30, put themselves together, they guarantee for each other. They do not need to have the same profession, but they have to be in the same geographical area. They will need to know and trust each other. Here, you can't trust anybody, so you have to know a person very well before you join a group." (FI7)

Because of the joint liability, it is generally not necessary to have a credit history with the bank before being able to request this type of facility, though this can significantly influence the loan size that one could be eligible for. Durations of these loans are typically between 5 to 6 months, with interest rates between 30 and 36%.

### Salaray loans

Salary loans are only provided to clients who receive a regular salary, which is paid through the bank. The repayment will automatically be made and deducted from the salary payments. These loans are often used for consumption and investment, as well as social purposes. The size of the loan is determined by the salary of the customer. The maximum duration for salary loans is often the longest of all credit products and can be extended up to 48 months, with interest rates between 30% and 33%.

### Susu loans

Susu loans are unique to rural financial institutions and are tailored to the needs of busy or remote people, who can't come to the bank to make deposits. Sales executives from the bank will make rounds daily to collect deposits for these customers. After having completed a certain period, often 3 months, of regular susu deposits, showing adequate cash flows, institutions will allow these customers to take out an individual susu loan, in which the repayment will often be divided into a daily amount that will be deducted from their daily susu deposits. While the size and terms of Susu loans are similar to microfinance loans, Susa loans are given out only on an individual basis.

The size of these loans will depend on the amount a person will deposit during this past time. Additionally, guarantors are often required to secure this type of loan:

"Susu and savings are almost the same. You have to have an audited account operational for 3 months or more. So we can look for the history so we know how much we can give. They need to provide 2 guarantors who also have to have an account here. We don't have a limit, this depends fully on the account." (FI7)

### Emergency loans

Rural banks and credit unions also differentiate themselves from commercial banks by their community focus. This is also expressed by the offering of emergency loans. These facilities are given out to people with a high need for cash because of a specific circumstance, for example, to finance a funeral, which culturally demands an extensive ceremony and sometimes pays for travel and accommodations of family members. These institutions will offer a short-term loan against a minimal interest to support these people.

"Ashanti people, the [funeral] ceremony is something else. It comes with huge expenses and it is often unexpected. We give them the amount they need up to 30.000 cedis." (FI9)

### Commercial loans

These loans are provided to companies or individual entrepreneurs to obtain capital to invest in their businesses. Institutions will demand different kinds of securities based on the requested loan size and estimated ability to repay. Primary securities that are used for these loans are cash liens, collaterals, and guarantors.

The first security that is often demanded is a cash lien, otherwise known as cash collateral, due to its high liquidity. With a cash lien, a client will need to have 20% - 30%, depending on the institution, of the total credit amount on their savings account before the loan is disbursed, and keep this amount on their account throughout the duration of the loan.

"We try to mitigate risk, so when asking for money, we want people to bring collateral. So another property like a vehicle. This happens when we look at a person's turnover and deem it not fit for the requested loan amount. If that person wants his requested amount he will be asked to put up extra

collateral. (…) Normally here we want short-term assets, specifically cash, because it is very liquid. So physical assets would be secondary." (FI5)

To declare physical collaterals people are required to bring documents of ownership, valuation reports and a personal declaration that the asset can be used as a loan security. Banks usually register this collateral with the Bank of Ghana, to avoid people using the same assets to serve as collaterals for multiple loans (FI9).

Institutions can also require guarantors to secure commercial loans. These guarantors often go through the same appraisal process as the applicant to determine their creditworthiness. Therefore, they will often also need to have a credit history at the same institution.

#### Insurance

There are 2 interviewed financial institutions (FI8 & FI9) that explicitly mentioned their use of loan insurance.

"The loan will have to be insured. The securities will not be used when a person dies for example. Therefore you insure against disability of payment. Another example, you have a car accident and you cannot work again. Then we do not go after family members. (…) However, this kind of insurance only works one time. If you say you cannot work again and want to benefit from the insurance, you can never receive the same kind of insurance again." (FI9)

### B.2.3. Loan application procedure

Loan application procedures are generally described by the following process. When a customer comes in with the request for a business loan, the client will first be educated on the conditions of the loan to ensure that they will understand the terms of the facility they are requesting. In some cases, people will go through a small financial educational course at the institution.

"We take 5 weeks to educate them. Once you form a group, we find a day that they can all meet. Then we educate them on how everything works." (FI4)

Subsequently, an appraisal process is initiated to ascertain the creditworthiness of the client. This starts with determining the basic personal details of the customer and a judgement of character.

"We look at the character of the person, who are you. If you are a farmer, what knowledge do you have, do you know your produce. We determine if he knows what he is doing." (FI5)

Then, the business is discussed, and the purpose of the loan, the revenue of the business, and its profitability is estimated based on interviews and deposit history. Also, the ownership of the business is determined.

"A lot of the times people come in, I let them know this is how the money is given and this is how the repayment is structured. I ask the person, what are you doing now? He or she will say I sell this. Then I ask how much money do you need. Then he or she will say (e.g.) I need 5000. This number often doesn't make any sense. So I ask further, how much do you have now and how much are you currently investing in the business you are doing? How much do you earn monthly, weekly and daily? All to determine whether you are creditworthy. To determine whether the client is expected to be able to repay. You want to make sure the client earns enough on a daily basis to easily be able to repay. (FI4)

"We do ask a lot of questions because of that. Sometimes we even want to know about a person's family, their educational background, what is your plan for them, in 2-3 years' time what do you want to do. It is friendly information but we just want to know if we can get something that might point to you wanting the loan for something else. So we do ask a lot of questions." (FI6)

Often, credit officers go into the field to check the business location, and the house of the applicant and to ask around in the neighbourhood to verify if people know the person.

"The challenge is that most customers don't keep records. Sometimes you have to come down to their level and ask them how much do you buy, at what price and how do you sell. This is so they would understand what you mean. When you ask, how much do make in a month, they would find it difficult to tell, because they don't have any record to show. Also you can ask around and compare prices.

People would say high prices just to get a higher loan. You investigate the figures a person gives you and check whether they are within a certain range." (FI8)

Banks also go to the credit bureau to check a person's credit history at other institutions. Based on the appraisal, the credit officer will make an offer with a loan of a certain amount. This can be lower than the requested amount.

"Sometimes we say based on above questions, we can only give you so much. A lot of the times people don't want it then. We want the loan not to collapse a person's business. The vision of microfinance is to support people to be financially stable." (FI4)

### B.2.4. Loan monitoring

Loan monitoring starts immediately after loan disbursement. Because customers often obtain the loan principal in cash at the bank, a phone call will be made to confirm that the client got home safely.

Generally, with these facilities, repayment is deducted from the deposit account. Therefore, most of the monitoring procedures consist of verifying whether a person is depositing sufficiently to be able to comply with the agreed repayment schedule.

Additionally, sales executives will visit the business sites of customers without prior notice to check if the loan recipients are around and to determine the state of the business, if there are improvements to be seen, and report this back to the credit officer.

"For susu, if you did not contribute 1 day, the next day, the officer will ask you why. We will then probably agree to double the deposit the next day, that is okay. The next day, we expect this contribution, if there is none we will question them again. Maybe the credit officer will go there themselves." (FI6)

"Let's say someone will default the first the month. Some of the customers are so gentle, so they will personally call you: "I have this problem so that is why I couldn't pay, so the next month I will add it and bring it." The first time that they will call us we will accept it in good faith. It can happen, so we agree with them. However, some of this applicant they are stubborn, it becomes a thing. They won't pay and keep saying they will add it to the following month but it will be another default. Then we would call them and visit them. The pressure will come when we see that the person pretended and does not want to pay." (FI10)

"After disbursement, we monitor, some of the customers will decide they want to repay daily, like with susu, then we give the applicant a susu collector that will be visiting them daily. The collector will deposit it in their account. The credit officer, or me [Branche manager], can visit and take the money from them. It depends on how the facility is structured. Some want it weekly, some monthly. The repayment is monthly, so some will decide to pay it like that. For example every 28th the applicant will bring the monthly repayment to us. Others, say for the month he is supposed to pay 2500. Today he will bring 500, next day 200. The important thing is that by the time the month is over it will amount to the 2500." (FI10)

### B.2.5. Credibility and diversion of funds

When asked about common causes of loan default all interviewed financial institutions point to diversion of funds. This happens when a person does not use the loan principal for the purpose that was agreed upon with the financial institution during the application process.

"Those who invest their loan in the business generally do not default. This is my experience, so this is what we have to be sure about. They use the entire loan to pay for school fees or rent. There is obviously no return from that. They will repay for 1, 2, 3 months and then we see diminishing in their shop. This signals to us that the person did not invest it in the business. We take caution then." (FI7)

Credit officers outline that they take certain measures to try to filter out people with this intent.

"To stop people from using loans for other purposes, this is a big problem. They will even come for a loan to pay off another. Sometimes what we do is just to delay them, and look at their reactions. The customers who are pressing us more are generally less trusted. Maybe we know someone around the area of the customer that we can call to check if they know if other banks are also coming around.

Ghanaians are pretty genuine, if they see something they will tell us. People misusing the money is the biggest risk." (FI7)

This problem is also strongly associated with a general lack of credibility that is emphasized by a lot of the interviewed financial institutions. "People often are not truthful. Even after this [application] process people are still dishonest. We need honest people so that they will also be honest with the loan repayment. If any information turns out to be wrong, the process is over of course." (FI4)

"Some even come to collect loans to sponsor their children abroad, schools etc. In the assessment, it would take too much for us to uncover such a hidden agenda. For the person, he or she knows, but they just cover it. They do all the necessary research and then divert [the money] to different things." (FI6)

### B.2.6. Challenges with agricultural credit provision

The interviews with financial institutions have brought to light several challenges that are associated with the credit provision to small-scale agriculture. These will be discussed in this chapter.

#### Weather dependency and market risks

First, financial institutions display a general notion that agricultural businesses are susceptible to some big risks, which can affect the profitability of these projects, and in turn the repayment of loans, which results in an aversion to give out facilities to this sector. Many financial institutions name the traditional horticultural techniques, their associated weather dependency and the consequential risk of floods or drought as a major challenge for loan repayment.

"The reason we don't like giving loans to farmers, those who farm solely, is the weather in Ghana. We don't use machineries, we depend solely on the weather. The weather can fail you. When you are waiting for the rain and the rain doesn't come, then all the capital is lost. We don't give loans to farmers, seriously, because the probability that a person will not be able to pay is high. Sometimes the rain will fall too much and spoil all the things, or the rain won't come. Farmers that use machineries won't want our small loans. We do assess you, maybe besides the farming you own a small thing. Then we can know, if the farm fails you, your wife can support you. But if you and your wife are depending solely on the farm, then for me it's not going to work." (FI7)

Furthermore, there are market risks in the form of price fluctuations. This happens due to several factors, but fundamental is the fact that the prices of fruits and vegetable are not regulated. Affected by a lack of adequate storage facilities, farmers only have a short time window to market their produce before it goes bad, in which the law of supply and demand plays a large role in the ability to sell produce for a good price.

"Farming can be profitable, but it depends on the season. When it fails you, you have a problem. Some seasons you can buy a box of tomatoes for 100 cedis, sometimes it is 2000 cedis. (…) When the weather is good in the whole nation, and everybody is growing tomatoes, you might not even be able to find a buyer." (FI7)

Also, bad infrastructure, in combination with traditional packing solutions, can lead to damaged produce, decreasing its value. Finally, the subjective value judgement of the market women also contributes to huge fluctuations in the prices farmers can get for their produce. With this big uncertainty, estimating the economic viability of a farmer's operation can prove to be very difficult.

"When the produce gets to the market, the reception is also a problem. For instance, if the farmer brings his produce to the market, the market women determine the price for the product. The farmer doesn't have a say in that. They make the farm so that it is seen as not important.." (FI5)

However, there are financial institutions that describe methods with which they deal with these uncertainties, appraise businesses, and give out loans to farmers. "After a season ends, the product supply is high, which means the price will be lower. What we do, we estimate how bad can it get? We know the minimum price for a crop by asking the market women, so we estimate the price ranges. If the market will fall, what will be the lowest price. We base our calculation based on the worst case scenario. We base the loan size on that." (FI8)

### Challenges with providing securities

Because of the increased uncertainty associated with the primary income of the farmer, banks tend to resort to a tighter collateral regime, and place more emphasis on the ability of farmers to provide collaterals, rather than base loan proposals on expected revenues (FI2). However, providing adequate collateral can be challenging for horticultural farmers. Biological planting materials or cattle is hard to value and thus to accept as collateral. Furthermore, farms are often located in rural areas on the outskirts or outside the city, where the values of buildings and land are much lower when compared to urban areas. The remoteness of farmers also results in challenges when trying to find like-minded, trusted people to form groups in order to apply for microfinance loans.

Also, even if there is land available to put up as collateral, proves of ownership are sometimes very poorly documented, and hard to obtain.

"If you want to use land, they would tell you that the land is family property and not entitled in their name. "The chief has given us the land." They don't have any documentation or papers saying it is in their name. We need those papers to be able to get the land when they fail to repay."

### Financial illiteracy

Institutions also point to the lack of financial literacy among farmers that results in poorly kept, or non-existing records that are required to determine creditworthiness to qualify for loans.

"Book keeping is not happening due to education. Information should go around. Ghana banking communities now have to educate people on the opportunities. How do you bank, how do you save. They don't know. Right now they ask for a facility, they don't get it, then they'll just leave us." (FI5) This sometimes results in bank employees having to go in the field to appraise businesses.

"Farmers don't record anything. When they need something, that is when they buy. We ask them how many times do you apply pesticides within a season, how much do you buy within a season. We ask the unit prices and do the calculations for them. What I do: when asking these questions, because they [the farmers] want to look good, they might feed you outrageous figures, so sometimes I will ask the same question twice throughout the conversation just to find out whether they are sure about the figures." (FI8)

### Difficulties with offering tailored credit products

Some financial institutions state that they have difficulties providing products that suit the needs of agricultural businesses. While recognizing that farmers need products that display certain conditions, for example in duration and repayment, that are attuned to the seasonality of a farmer's income and expenses, they see difficulty in providing such products because it is not in line with their risk preference and monitoring procedures.

"The money, when it goes, it needs to come back. You want to invest where you can check daily if the money is coming back. The seasonality of agriculture causes durations of months before you can get anything back." (FI3)

"But the farmers specifically, we don't have a tailored product for them. Because of the risky nature of their business. It is periodic sales structure. Only income coming at the harvest period. In between loan disbursement and the period where they would be able to repay is not just a month, it is way longer. So the risk involved is why we have not taken the opportunity to design such a product or criteria." (FI6)

# C

# ATLAS.ti networks

This chapter will include the ATLAS.ti networks made with codes that emerged from the interview analysis.

## C.1. Networks of interviews with farmers

Figure C.1 contains an overview of all the topics discussed with farmers organised in codes that emerged during interview analysis. Figure C.2 gives an overview of the topics discussed with farmers and their relations with financial inclusion factors (white), organised in codes that emerged during interview analysis.

## C.2. Networks of interviews with financial institutions

Figure C.3 contains an overview of all the topics discussed with financial institutions organised in codes that emerged during interview analysis. Figure C.4 gives an overview of the topics discussed with financial institutions and their relations with financial inclusion factors (white), organised in codes that emerged during interview analysis.

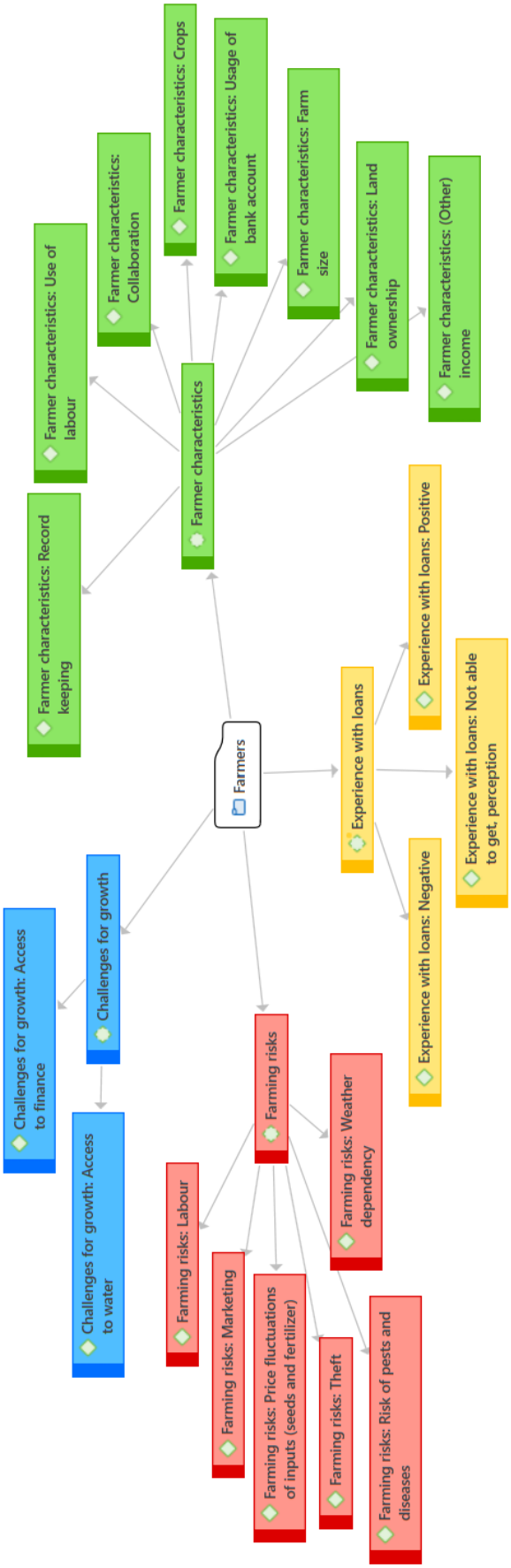


**Figure C.1:** Overview of all the topics discussed with farmers organised in codes that emerged during interview analysis.

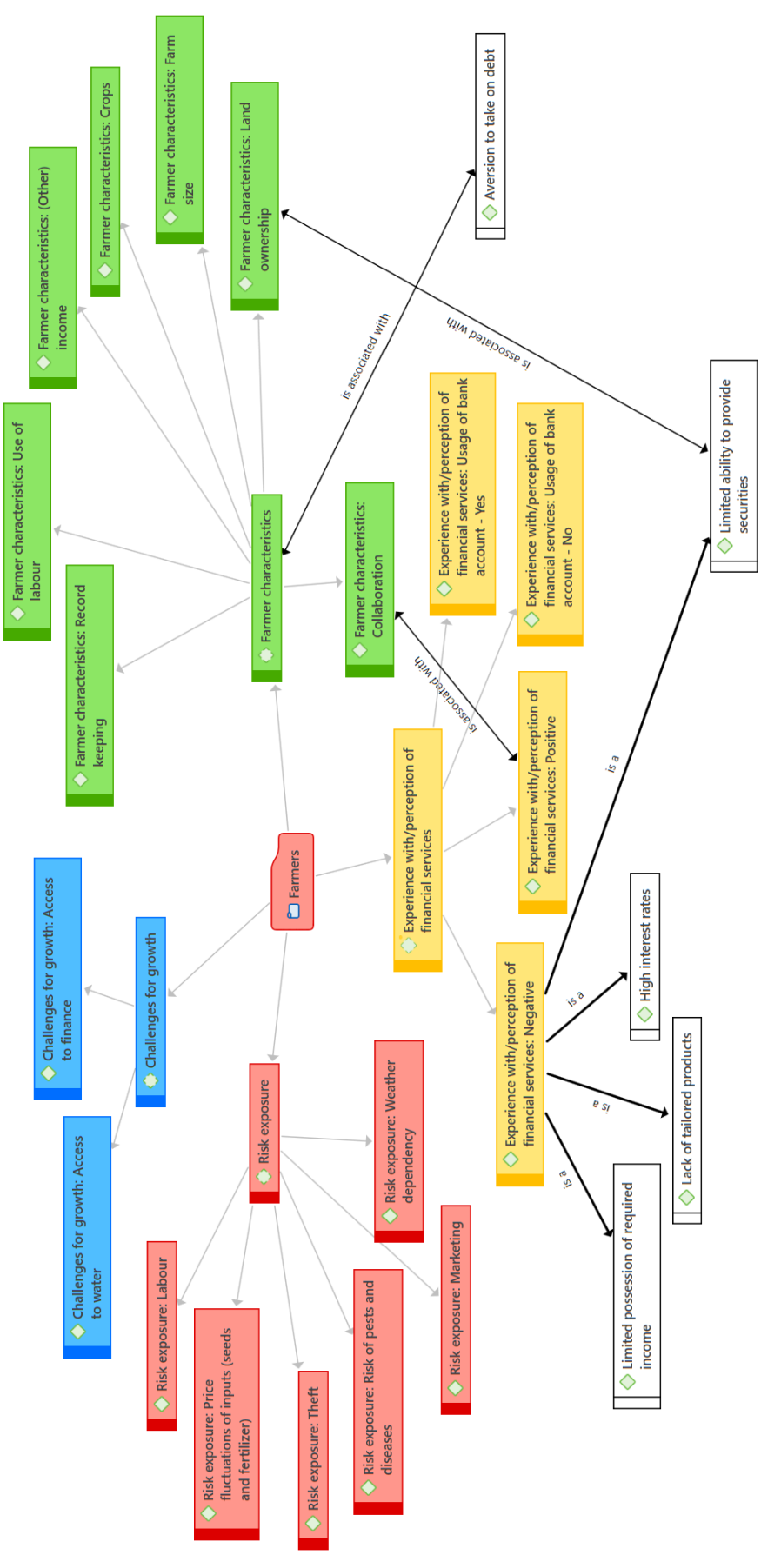


**Figure C.2:** Overview of the topics discussed with farmers and their relations with financial inclusion factors (white), organised in codes that emerged during interview analysis.

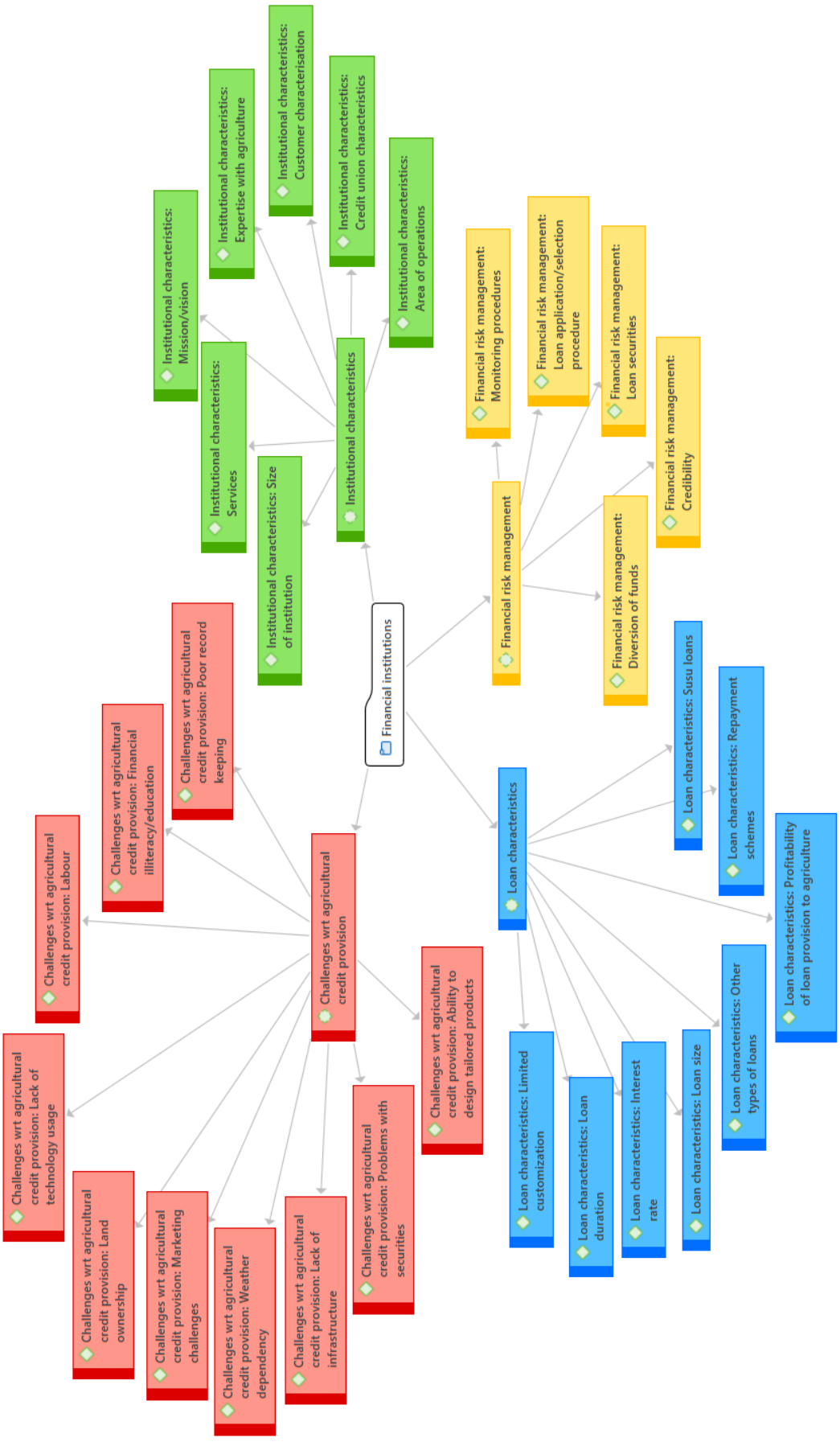


**Figure C.3:** Overview of all the topics discussed with financial institutions organised in codes that emerged during interview analysis.

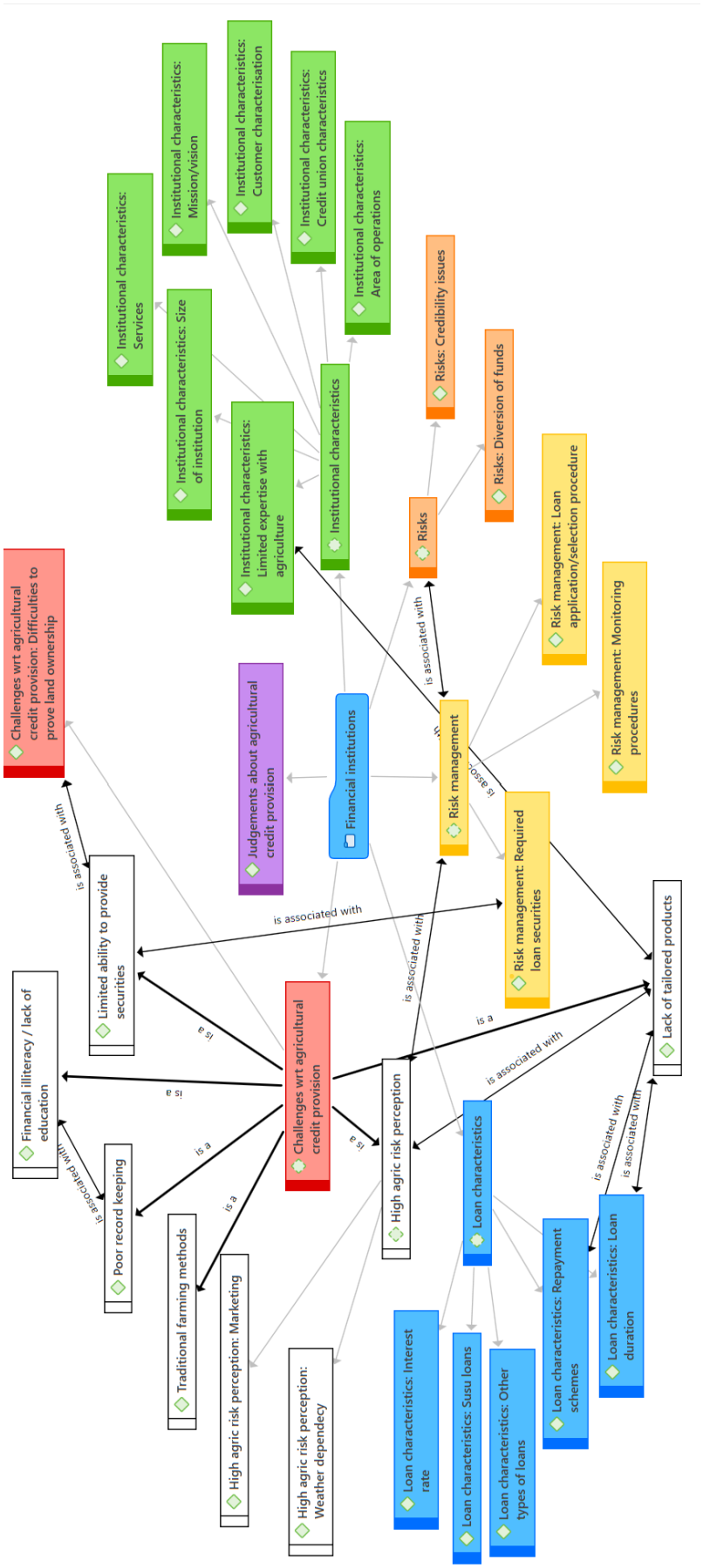


**Figure C.4:** Overview of the topics discussed with financial institutions and their relations with financial inclusion factors (white), organised in codes that emerged during interview analysis.